Sewerage and Sewage Disposal Apparatus, &c.

K
54314

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The M. J. & S. H. ADAMS Firms are—

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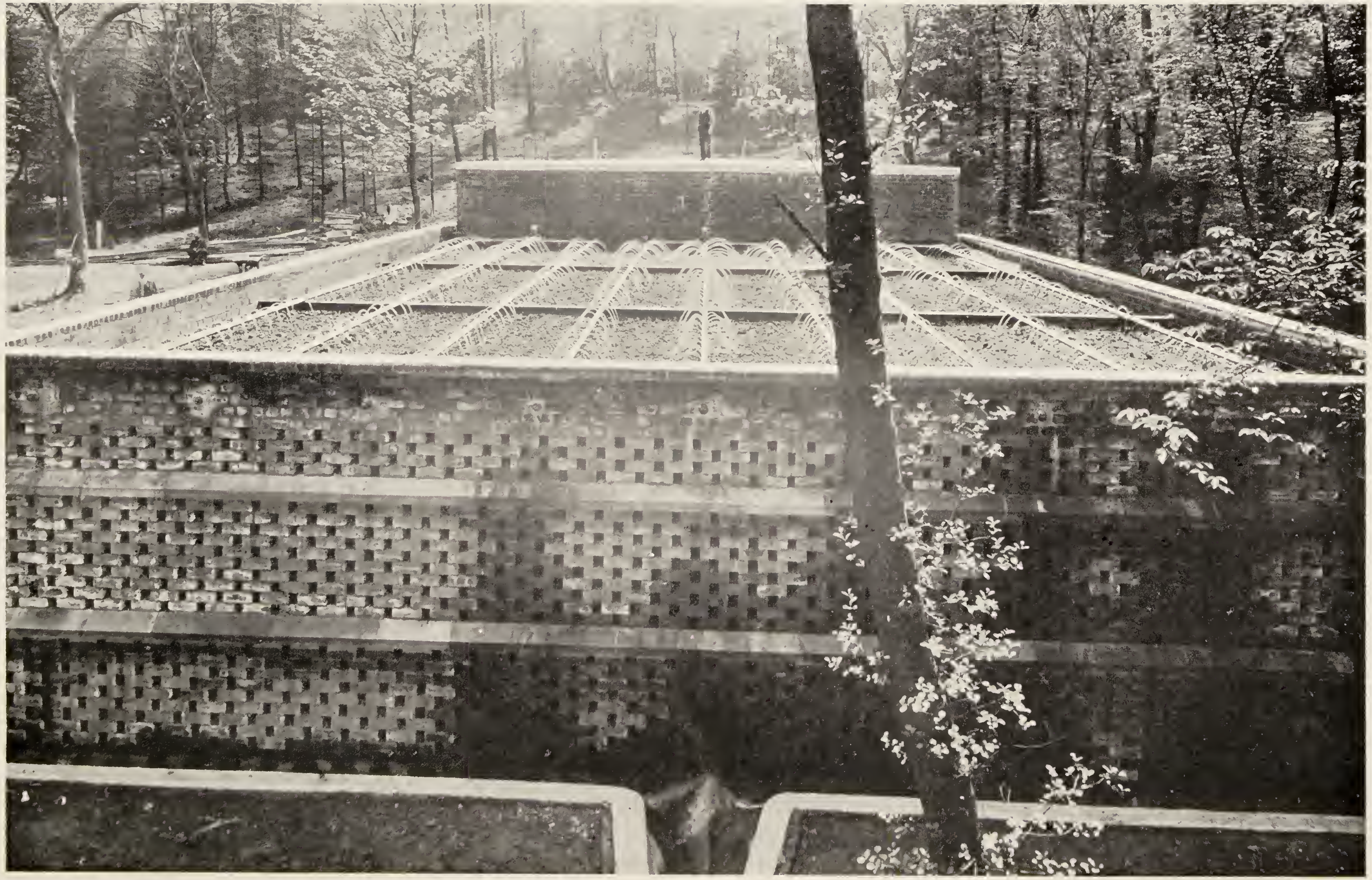

SPRAY PIPES FED FROM SYPHON TANK UNDER VARYING HEAD.

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Late THE ADAMS' PATENT SEWAGE LIFT CO., LTD.,

Are Makers to . . .

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THE HOME, FOREIGN, AND COLONIAL OFFICES AND GOVERNMENTS,
and the leading Engineers throughout the civilized world.

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This Book comprises the following Sections:—

SEWAGE DISPOSAL APPARATUS,
SEWAGE LIFTING ,,
SEWER FLUSHING, ,,
A CATALOGUE OF SEWERAGE WORKS CASTINGS AND SPECIALITIES.

ADDRESSES.—Works: YORK and SCOTSWOOD-ON-TYNE.
London Offices: 7, OLD QUEEN STREET,
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Telephone:
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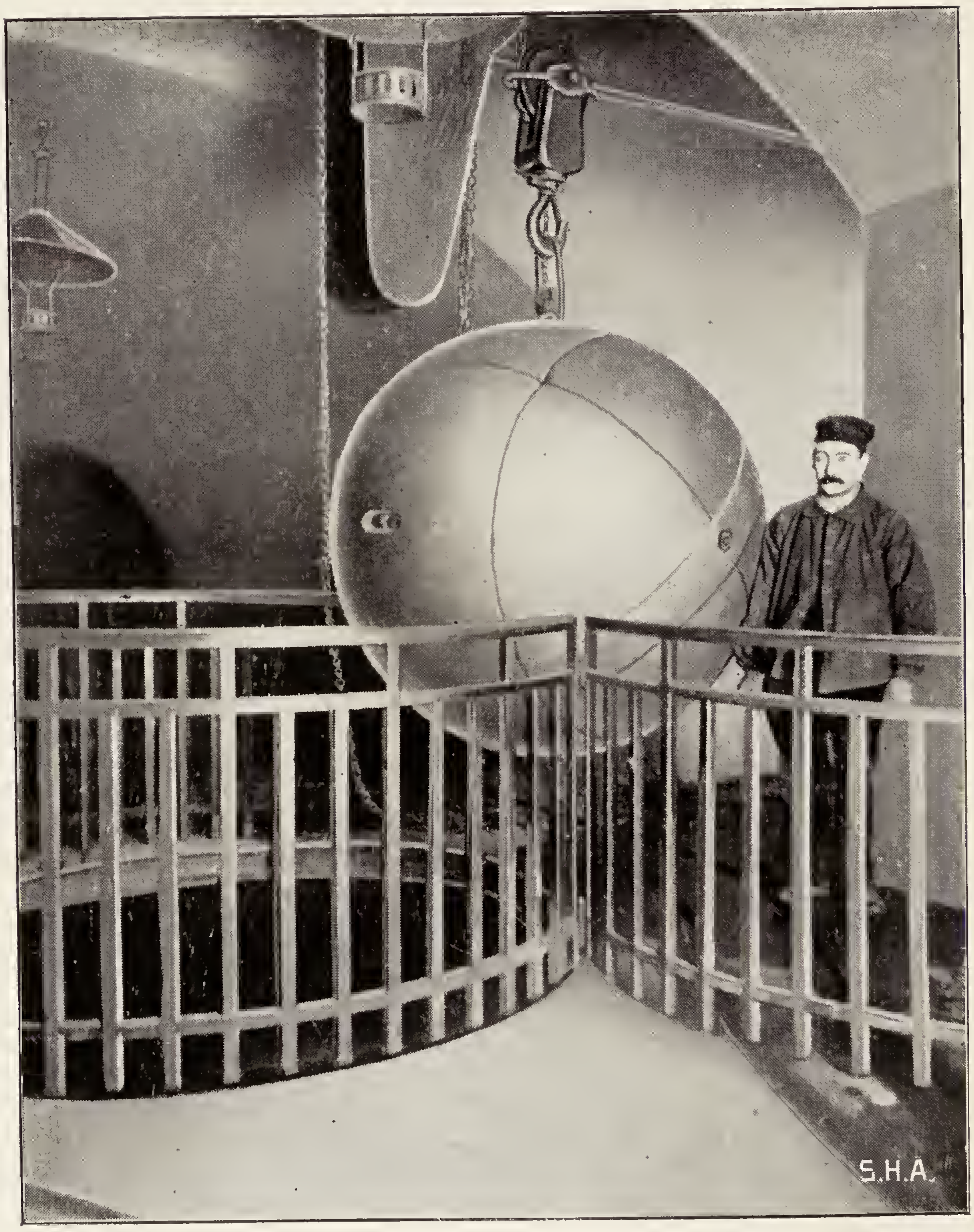
Sewer Flushing.



One of the large wooden balls used for scouring out the Paris Sewers—shewn slung in position over sewer mouth.

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Introduction.

WHILST the primary object of this book is to draw attention to the Automatic Apparatus for handling Sewage—which has been fitted by the writer's firm in upwards of 400 installations—it may nevertheless be regarded as a work of reference on Bacterial Sewage Disposal methods, most, if not all, of which are illustrated and described. The earlier pages of the section—"Sewage Disposal"—deal with the first processes—Detritus and Liquefaction Tanks, Storm Overflows, and Weirs, etc. The later shew the final processes necessary to the production of a satisfactory effluent. The process selected will depend probably solely upon local conditions—where the depth is sufficient* continuous filtration may be resorted to, in which case the "Cresset" Revolving Distributor, with its frictionless Air-Lock coupling, may be used; in other cases, Fixed Spray Pipes, or Double Contact Beds may be preferred. The operations of the latter are well controlled by means of the Air-Lock Supply and Timed Syphons, which have been so largely used for this purpose. The difficulty of dealing with low level Sewage is greater, but may frequently be obviated by the use of the New System for shallow depths (see page 55), in which the lateral travel of the Sewage in transit through a series of beds—upon a common level—compensates for the greater depth required in other systems. Where, however, pumping must be resorted to, it is frequently the case that the Sewage of the higher levels will serve through the instrumentality of the Automatic Sewage Lift (pages 9, etc.) to raise that of the low, with the result that the cost of pumping is practically nil—no engines or other motive power requiring up-keep and attendance being employed. This apparatus now raises about two million gallons of Sewage daily, the greater part by means of high level Sewage, effecting a saving of probably more than £4,000 per annum.

---

* "The Local Government Board Requirements" to date, with additional data giving depths, areas, and volumes treated—summarised and tabulated by S. H. ADAMS, and published by the St. Bride's Press, Bride Lane, Fleet Street, London. Price, 2/6.

It is suggested that engineers should lay down their sewers with a view to the adoption of this system, rather than incur the annual charges incidental to a pumping scheme. For handling Sewage the simplest possible apparatus should be used. The introduction of Automatic apparatus does not mean necessarily the abandonment of all supervision, but rather that this supervision is largely reduced. All Automatic apparatus should be regularly inspected at stated intervals. One tenth of the care required by non-Automatic would ensure the perfect working of the Automatic.

In the "Sewer Flushing" section (page 92) reference will be found to the various types of Syphons manufactured—Flushing, Alternating, Sequence, Timed, etc. These draw from 6-in. depth of water upwards, and have a discharge diameter of from 3-in. to 36-in., or more. They are fitted with or without side or vent pipes, etc., according to the duty they are intended to perform. Systematically flushed sewers do not evolve sewer gases. They may be laid also at grades otherwise impossible.**

It is estimated that of all Flushing Syphons in use some 64% are from the ADAMS' firm.

A Special Syphonic Apparatus is made for regulating time of discharge into tidal waters.

This book is divided into four sections—AUTOMATIC SEWAGE LIFTING, SEWAGE PURIFICATION, SEWER FLUSHING, and a Catalogue of SEWERAGE IRONWORK, PENSTOCKS, VALVES, etc.

The Illustrations are intended to show the application of Adams' Patent Apparatus to different representative systems. It follows, therefore, that no responsibility can be accepted for the system adopted, but for the apparatus alone, which is guaranteed in every case to perform its functions satisfactorily, provided that the constructional works, with which it may be incorporated, are carried out in a workmanlike manner.

The Illustrations and descriptive matter are copyright.

S. H. ADAMS, A.M.I.C.E.

** "Sewer Flushing Diagrams," prepared from tests upon various sewers to prove velocity due to flush—in sheet form for office use, by S. H. ADAMS, 7/6. St. Bride's Press, Bride Lane, Fleet Street, London.

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38, PARLIAMENT STREET,
WESTMINSTER,
3rd May, 1904.

THE ADAMS' PATENT SEWAGE LIFT CO.

GENTLEMEN,

DOUGLAS SEWERAGE.

We have much pleasure in stating that we have just completed four sets, in duplicate, of your Lifts in connection with the Sewerage of this town, making use of the Sewage from the higher districts of Douglas to lift the Sewage from the low-lying districts bordering the sea front and harbour. The first of these Lifts has been in use for three years, and has worked throughout most satisfactorily, and the second of these Lifts has now been in operation for nearly two years. The latter and the subsequent Lifts were only ordered after both the Corporation and we were satisfied with the efficiency of the first installation.

In districts such as Douglas, where there is a considerable proportion of the Sewage coming from the high land and the Sewage from the low land has to be lifted, we are of opinion that your system is far in advance of any other system for raising Sewage. Our reasons for this are (1) there is only one moveable part of the opparatus—namely, the back Flap Valve, which cannot by any possibility get out of order; and (2) that the cost of maintenance and inspection and working of the Lifts is reduced to a minimum.

We are, Gentlemen,
Yours faithfully,
STEVENSON & BURSTALL.

NOTE.—The above is a copy of a letter from Messrs. STEVENSON and BURSTALL, Civil Engineers, Westminster, from whose plans the Sewerage of Douglas, I.O.M., has been carried out. The adoption of the Sewage Lift has saved the town the cost and annoyance of the usual pumping machinery.

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Sewage Disposal, etc.

FOUR YEARS AGO the first Bacteria Beds installed in this country at Sutton, Surrey, were operated by Hand Valves. These were removed, our syphonic apparatus being substituted. We have since fitted up the following amongst other Sewage Disposal Works. The list is in no sense complete, it is given for puposes of reference only, it does not refer to works carried out abroad—in the United States, South Africa, India, China, France, Belgium, Russia, Norway, Sweden, etc.

Communications regarding these or other works will be appreciated.

Apparatus for Bacteria Beds, Continuous Filters, Revolving Distributors, etc.

MUNICIPAL AND RURAL.

Annfield Plain
Armagh
Abram
Aldermaston
Apperley Bridge

Birmingham
Basingstoke
Buxton
Bebside
Bingley
Billericay
Bradford, Yorks.
Bradford-on-Avon
Billingshurst
Bromborough
Barking
Busby
Burnley
Bowness
Bleasley Hill
Blakedown

Croydon
Crigglestone
Croy
Cleland
Chelford
Clones
Crofton
Crewe
Crookedholme
Carlisle
Cramlington
Chorley
Cowdenbeath
Canklow
Conisborough
Chesterfield

Dalry
Dinnington
Dorking
Durham
Doncaster
Denton
Derby
Durham
Dringhouses

Epsom (2nd repeat)
Ealing (3rd repeat)
Edzell
Exning
Erith

Fairfield
Festiniog
Fenny Stratford
Frizinghall
Fence

Greetland
Goyt Mill
Greengates
Guildford

Harbledown
Harmston
Hounslow
Hornsey
Handsworth
Holmfirth
Hurley
Hanley
Highworth
Holme
Hurlford
Hemsworth

Kildare
Killamarsh

Kilburnie
Kilkenny
Keith
Kelty

Leighton Buzzard
Leicester
Llantwit
Lincoln R. D. C.
Ludworth
Lanchester
Lochmaben
Leasingthorne

Macclesfield
Moffat
Milford
Morpeth
Manod
Meldrum
Marsden
Miskin
Midhurst
Milnrow

Neston
Newport
Northwich
Newmarket

Oldbury

Penicuik (2nd repeat)
Pembury
Potton
Pinner

Radlett
Ripley

Sutton, Surrey
(3rd repeat)

Staines

Sudbury
Salisbury (3rd repeat)
St. Albans
Sandwich
Strathaven
Snitterfield
Simonstown
Skipton
Southowram
Sefton
Shere
Sonning
Shirebrook
Stourport
Southborough

Tideswell
Thornhill
Tenterden
Tanfiel
Thorpe
Tutbury
Treeton
Thornley

Vardre

Weston Fayland
West Firle
Walsall
Woodhouse
Woodford
Wrexham
Wrenthorpe
Waltham Abbey
(2nd repeat)
Wealdstone
Wentworth

York

Sewage Disposal, etc.

PUBLIC INSTITUTIONS.

- Ancoats Hospital
- Bangor Asylum
- Byfleet
- Beeston Castle
- Curragh Camp (Royal Engineers)
- Clare Hospital
- Caldy Sanatorium
- Delamere Sanatorium
- Dundee Sanatorium
- Delamere Hospital
- Guernsey Hospital
- Grange Hill Station
- Gartcosh Asylum
- Holloway Sanatorium
- Kingseat Hospital
- Kirkcaldy Fever Hospital
- Keycol Hospital
- Minster Hospital
- North Cheam Hospital
- Naval Hospital, Shotley
- Pinewood Sanatorium
- Southborough Hospital
- Virginia Water
- Woodilee Asylum
- Whitleets

PRIVATE INSTALLATIONS.

- Adlington
- Arnport House
- Ballogie
- Birstall
- Boreham
- Baynards
- Burton House
- Bovey Tracey
- Banks
- Cove House
- Cheveley Park
- Elloughton
- East Mount
- Fareham
- Finnley Hall
- Glenturret Lodge
- Godalming
- High Head Castle
- Herringswell Lodge
- Hundith Hill
- Kinross House
- Langhurst
- Llanover Hall
- Mayfield
- Molescroft
- Middleton Hall
- Minster Cottage Homes
- Milngarvie
- Northfield
- Norton Hall
- Ollerton
- Press Ridge
- Penmænpool
- Portadown
- Pollacton
- Rosewood House
- Red House
- Shivenham
- Sanquhar
- Sandhills
- Strettingham Rectory
- Southhill
- Stranraer
- Sundlebridge
- Stillington Hall
- Totteridge
- Thornbridge Hall
- Valency House
- Warnham Lodge
- Westerton
- Whily House
- Ware
- Wentworth Castle
- Witney Court

Some SEWAGE LIFTS in operation.

(1,800,000 gallons raised daily by our Lifts).

- Abbey Hulton
- Acomb
- *Bowness
- Brecon
- Barmouth
- Bucknall
- Bexhill
- Bethnell Green
- *Broadstairs
- Barkinside (for G.E.R.)
- Chigwell (for G.E.R.)
- Clacton
- Crayford
- Clones
- City and S.W. Ry.
- Christleton
- *†Douglas
- Devonport
- Driglington
- Edinburgh
- Ebchester
- Folkestone
- Glasgow Cross Caln. Ry.
- Grimsby
- Grange
- Hoylake
- Hounslow (War Office)
- Hurlingham Club
- Ilkley
- Lullingstone Castle
- Mottisfont Abbey
- Malvern
- North British Mercantile
- North Riding Asylum
- Otley
- Portland
- Poole
- Rotherham
- Rugby
- Rugeley
- Sonning
- Seven Kings (G.E.R.)
- Syon House
- Southampton
- Shrivenham
- Tiverton
- Weymouth
- Walthamstow
- Yeovil
- And many others at home and abroad.

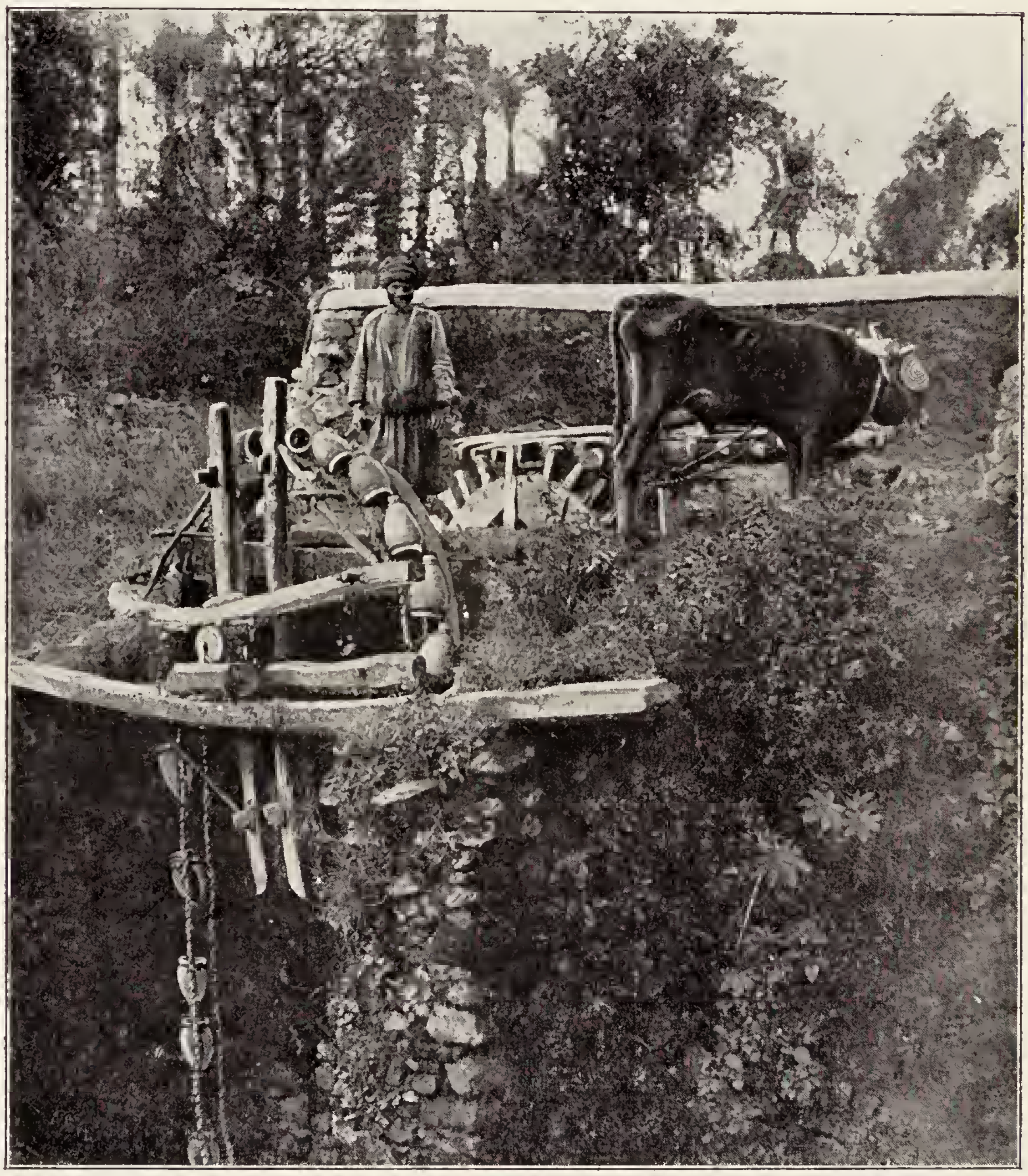
---

* Engine and Pumping Plant removed to make way for Sewage Lift.

† A complete scheme first cost saved £4,000, annual saving £500 and upwards.

Adams' Patent Automatic Sewage Lifts

FOR PUMPING WITHOUT COST.



A Primitive Water Lift.

ADAMS' PATENT AUTOMATIC SEWAGE LIFTS { HAVE worked for five years without cessation, breakdown, repair, or cost, and are now lifting 1,800,000 gallons of sewage daily,

Adams' Patent Automatic Sewage Lifts.

(As used by H.M. War Office, Home and Foreign Governments and Municipalities, &c.)

Awarded a Grand Prix and Gold Medal, Paris Exposition, 1900.

GENERAL DESCRIPTION.

THE SEWAGE LIFT was designed to raise low level Sewage automatically by means of high level Sewage, and thus without annual cost. It has proved eminently satisfactory. At Douglas, a saving of from £500 to £700 per annum is effected by its adoption. The total volume of Sewage raised daily by these Lifts to date in this country (*i.e.*, exclusive of foreign work) is 1,800,000 gallons. Of this 3-4ths is raised by high level Sewage. This represents at 2d. per 1,000 gallons (a price at which only large volumes can be raised) a yearly saving of £4,106 5s.

The Sewage Lift combines in one apparatus all the functions of an engine and pumps—the only moving parts ordinarily employed are the plain flap valves admitting entry of Sewage to the "Forcing Cylinder" or Ejector.

The Sewage Lift is used for the following purposes:—For raising Sewage to Filter Beds. From Underground Conveniences. From Underground Railway Stations. From Restaurants. From Hospitals. From Building Estates, Outlying Districts, &c., &c.

Lifts have been in unceasing operation, *i.e.*, working day and night continuously for more than five years without breakdown or stoppage, or cost in wear and tear or maintenance, and often without inspection for months. It is apparent that such a statement can apply to no other system or apparatus.

The Sewage Lift usually repays its cost in from three to five years. The Sewage Lifts may be either wholly below or partly above ground.

It is suggested that Engineers should lay down their plans with a view to the adoption of the Lift rather than incur the annual outlay following the use of mechanical pumping plant.

Adams' Patent Sewage Lifts.

GENERAL DESCRIPTION.—*(Continued.)*

The Sewage Lift is actuated by air compressed by a column of Sewage or water. In effect it is an automatic engine, compressor and pumps combined; but as the result of the careful application of certain fixed laws the only moving parts required are the plain inlet flap valves. Its use (where the conditions are favourable) means the substitution of a self-acting Lift—worked by waste liquid—entailing practically no annual expense, for the costly engines and pumping plant usually employed. The distance between the air and "Forcing Cylinders" is immaterial. The greater this distance, however, the greater will be the volume required at the high level.

☞ Lifts have been in operation for five years, working night and day without cessation, and at no cost for wear, tear, or maintenance.

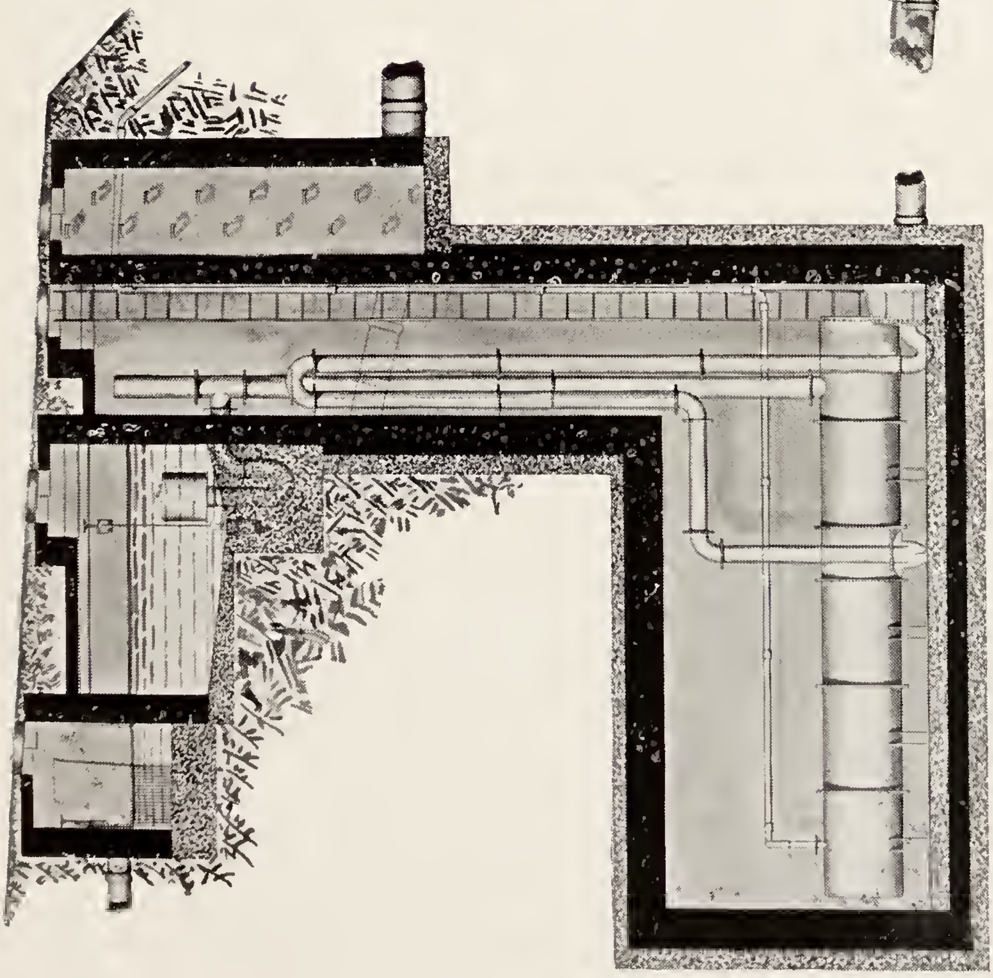
More than £4,000 per annum is now saved by the use of ADAMS' PATENT SEWAGE LIFTS.

In all cases the Sewage, &c., to be raised gravitates to the "Forcing Cylinder" or Ejector, entering it through a plain, non-return flap valve. Liquid is fed to a Flush Tank in the "Air Chamber" and discharged through its pressure pipe to the "Air Cylinder," displacing the air therein, which passes by an air-pipe to the "Forcing Cylinder," exerting there its pressure upon the Sewage to be raised, the latter being discharged through the rising main. The "Air Cylinder," when full, is emptied by means of a syphon. The sectional drawing (page 11) shews the Lift entirely below ground. It will be seen that Sewage enters the Flush Tank, that this tank discharges its contents to the "Air Cylinder" beneath it, and that the air-pipe extending from the "Air Cylinder" to the "Forcing Cylinder" will deliver air to the latter, and that this air will drive out the liquid contents of the "Forcing Cylinder," and that after this operation the contents of the "Air Cylinder" will be withdrawn by the syphon shewn in order that this cylinder may be emptied in readiness for the next discharge of the Flush Tank. The withdrawing syphon from the "Air Cylinder," and the rising main from the "Forcing Cylinder," both deliver their contents to the intercepting sewer. Where local conditions do not allow of the Flush Tank being placed beneath the ground, this may be supported upon a column or within a tower—the supply being led under pressure to it. Where Sewage is not available the town's water supply may be often advantageously used. The wisdom or otherwise of thus operating the Lifts will depend upon the cost of the water.

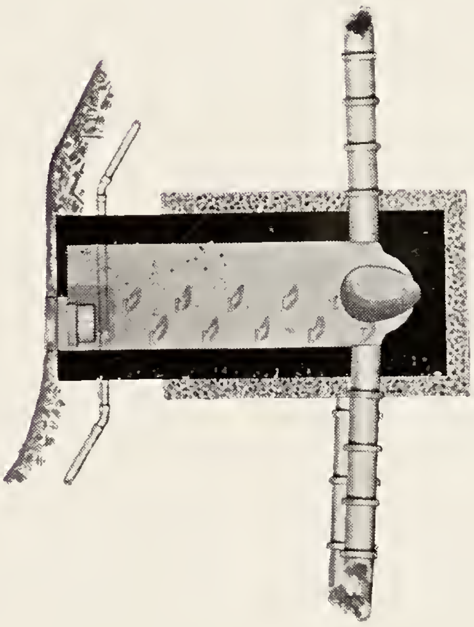
The amount of liquid expended to raise a given volume will vary with local conditions.—the height of Lift, &c., from 60% up to 400 or 500% for excessive Lifts.

Adams' Patent Sewage Lifts.

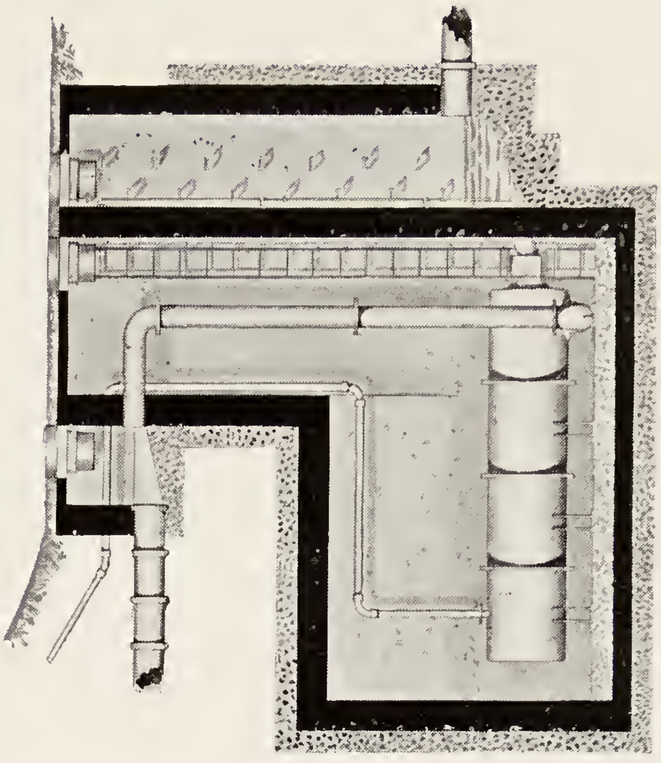
High Level Sewage raising Low Level Sewage to Intercepting Sewer.



Air Chamber or Power Station.
High Level.

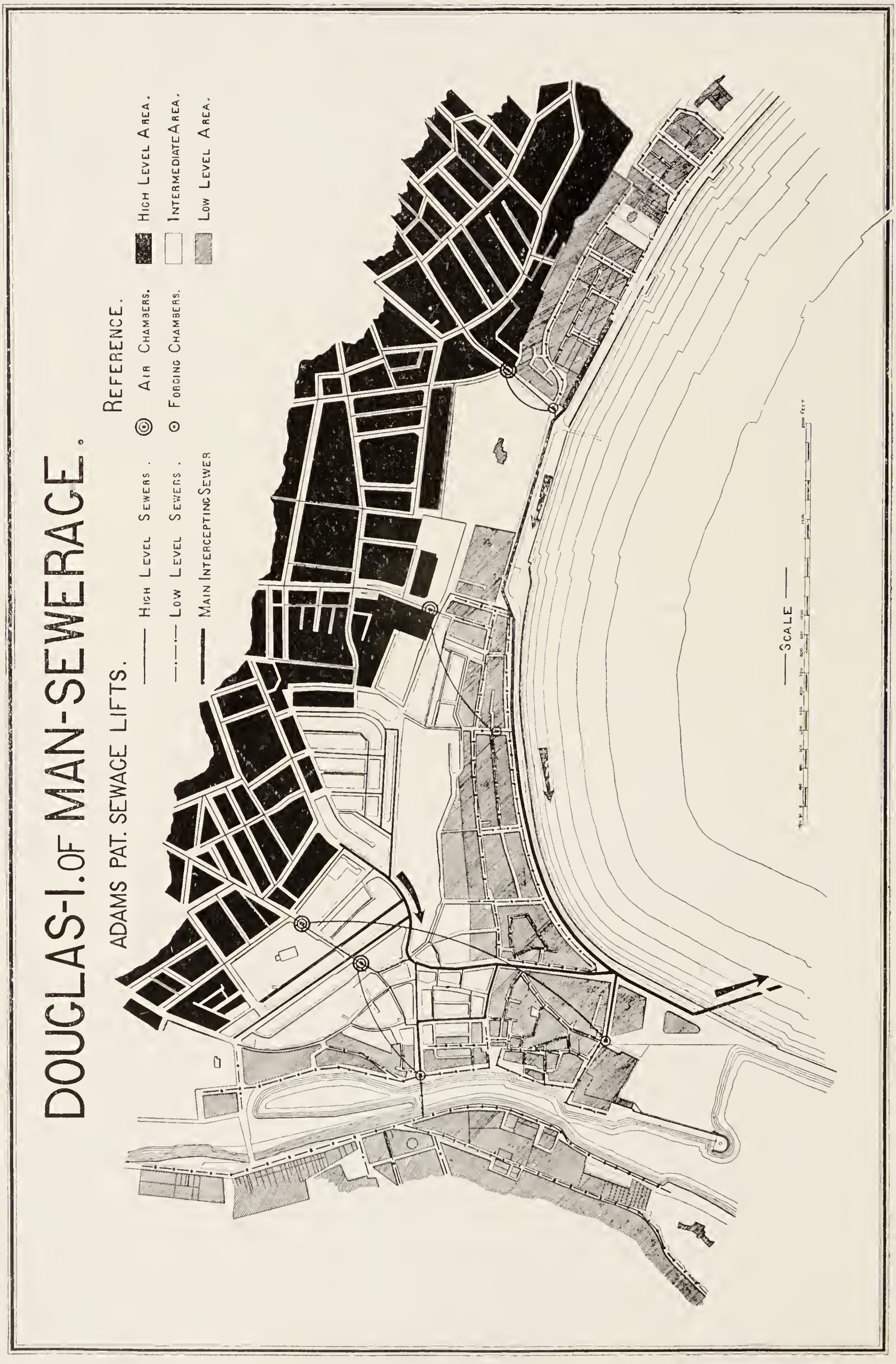


Intercepting Sewer.



Sewage Ejecting or Forcing Chamber.
Low Level.

Adams' Patent Sewage Lifts.



Plan shewing positions of Air and Forcing Cylinders.

Adams' Patent Sewage Lifts.

Douglas Bay.

THE whole of the low level sewage here is raised by our automatic Sewage Lifts which are entirely below ground—see page 11. These have a combined discharging capacity of 1,000,000 gallons per day. Taking ¼ as the average volume lifted per day the saving effected by the use of the apparatus at 2d. per 1,000 gallons may be estimated at about £700 per annum. The cost of installation must be set against this; it is evident, however, that such a saving will compensate for a very generous initial outlay; There are 4 distinct Lifts here—see plan, opposite. A portion of the high level sewage is delivered to each Air Cylinder (in one instance the fall being sufficient, the sewage is used twice over). The sewage after passing through the Air Cylinders is discharged to the gravitation sewer. Each Forcing Cylinder receives the low level sewage from its own particular area—this sewage is driven up the rising mains to the gravitation sewers above from which it flows to the outfall. The Lifts are entirely automatic, requiring no attention other than an occasional inspection by the ordinary sewerman. The Lifts are entirely noiseless, give off no offensive gases, and are as permanent as any sewer fixture.

Messrs. STEVENSON & BURSTAL, Civil Engineers, Westminster, E.C.:—

> "We have much pleasure in certifying to the value of your Automatic Sewage Lifts in districts suitable for its installation, such as Douglas (Isle of Man). We inspected the Lift there a short time ago and found it working satisfactorily—so much so that the Corporation have decided to put in other three sets. The work carried out by you is most satisfactory."

Adams' Patent Sewage Lifts.

ILKLEY, Yorkshire, where the Sewage Lift is entirely beneath the road, and the Forcing Cylinder at about the position of the **x** shewn. The Lift is entirely noiseless—without smell or other objectionable feature. It has been in continuous operation for about five years. It is actuated by the Sewage of the higher levels, and thus wholly without cost.

M. MEWES, the Architect to the French Government:—

> "The Sewage Lifts were installed in May, 1898, and have worked continuously without trouble or oversight in the most satisfactory manner."

Messrs. J. MOORHEAD and J. M. DUNSCOMBE, New York:—

> "Your apparatus has been in use here for the past two years, during which time it has proved satisfactory in every respect. The cost of repairs during the time has been nothing."

HERBERT HEAPS, Esq., Deputy Borough Engineer, Grimsby:—

> "The Sewage Lift you put down some seven years ago has worked continuously since that date. So far nothing has got out of order, and it has cost nothing for repairs. Apart from occasional inspection, it requires no attention. The Lift is entirely automatic."

Adams' Patent Sewage Lifts.

The Bowness Lift Tower.

HERE, no suitable site being available below ground, the tower shewn has been erected—in this the Flush Tank with its pressure pipe and Air Cylinder are placed. The "Forcing Cylinder" is at the low level, an air pipe connecting the two. The rising main has a length of about 420 feet. The sewage is raised a height of 32 feet.

In this case the former Engine and Pumping Plant, operated at a cost of £104 per annum, were removed to make way for the Sewage Lift, which is working entirely without cost, being operated by the high level sewage.

FRANK W. GARNETT, Esq., Chairman; THOMAS GIBSON, Esq., Surveyor;
Bowness-on-Windermere U.D.C.:—

"We formerly pumped our sewage (low-level) through a rising main 420 feet long a height of 32 feet by means of a gas engine. The cost of this may be placed with the man at £104 per year. The engine and pumps have been discontinued by us, and your Sewage Lift installed. This Lift utilizes the high-level sewage to raise the low-level; it has worked day and night for the past 12 months, without stop or trouble of any kind, it only requires casual inspection. Since its introduction the pumping has been done entirely without cost, excepting that represented by the interest upon the outlay."

Adams' Patent Sewage Lifts.

Glasgow Cross Underground station (Caledonian Railway Company).

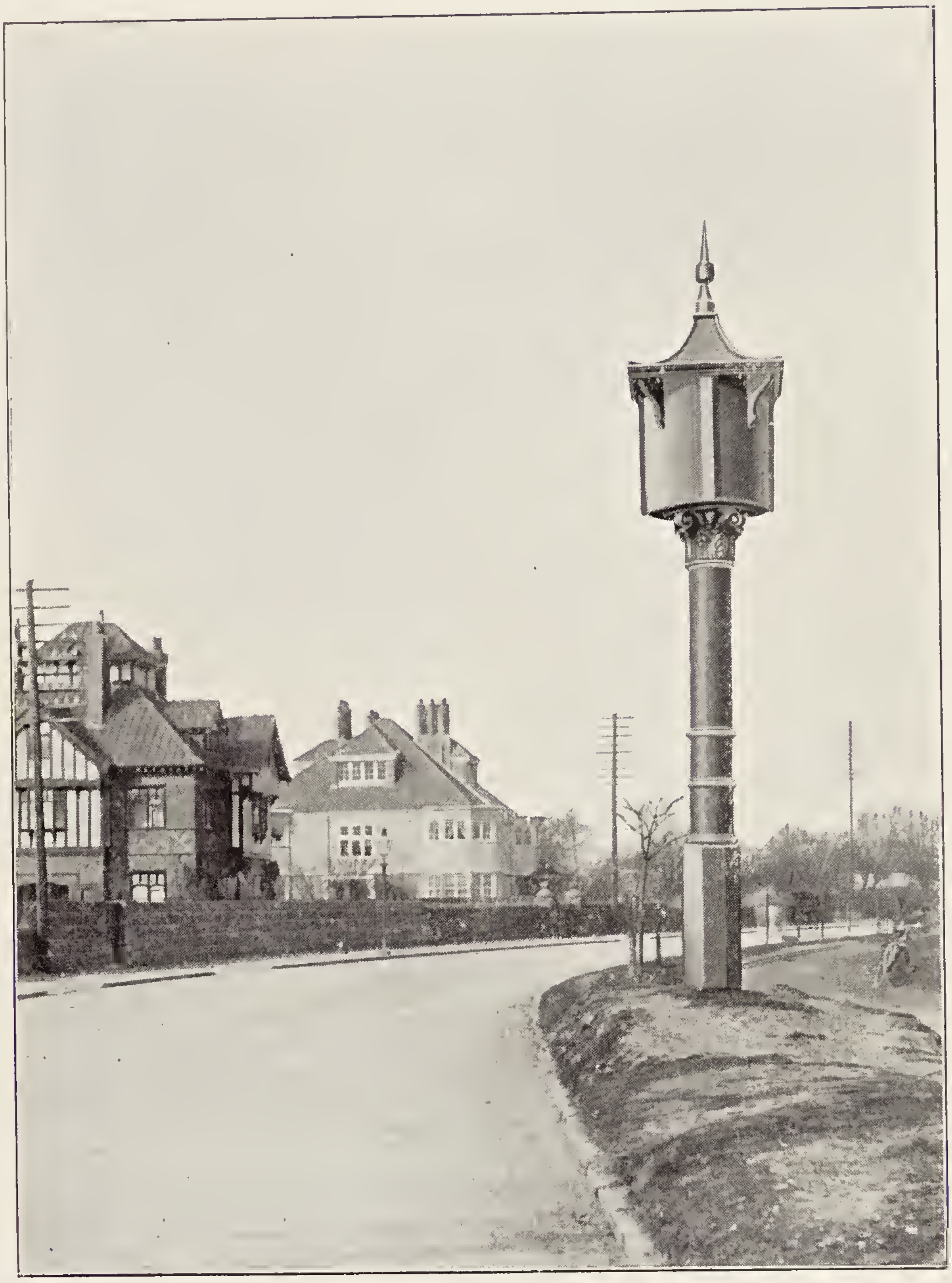
THE sewage from the conveniences at this station, which is below sewer level, is raised to the main sewer above. The Flush Tank and "Air Cylinder" are placed in the booking office, and the "Forcing Cylinder" below. Town's water is used, which is afterwards stored in a tank from whence it is drawn for the sanitary fittings in lavatories, etc. This Lift has been in continuous work for more than five years.

The Lift is largely used for raising the sewage from underground conveniences, hotel basements, etc.

CHARLES FORMAN, Esq., Engineer to the Caledonian Railway Company, Glasgow (Sir J. WOLFE BARRY, Consulting Engineer):—

> "The apparatus you fitted up for me at the Glasgow Cross Station is working quite satisfactorily. The Company's Engineer who maintains this part of the line informs me that it serves its purpose admirably."

Adams' Patent Sewage Lifts.



Sewage Lift, Hoylake.

THIS view shews the Flush Tank supported upon a cast iron column, the pressure pipe is within the column. The Air Cylinder and the Forcing Cylinder are both in a brick chamber below. The tank is supplied from the service mains. The water after transit through the Lift is used for sewer flushing. This Lift has been in continuous work for more than five years, it has cost nothing during that time for repairs or attendance.

THOS. FOSTER, Esq., Surveyor, Hoylake :—

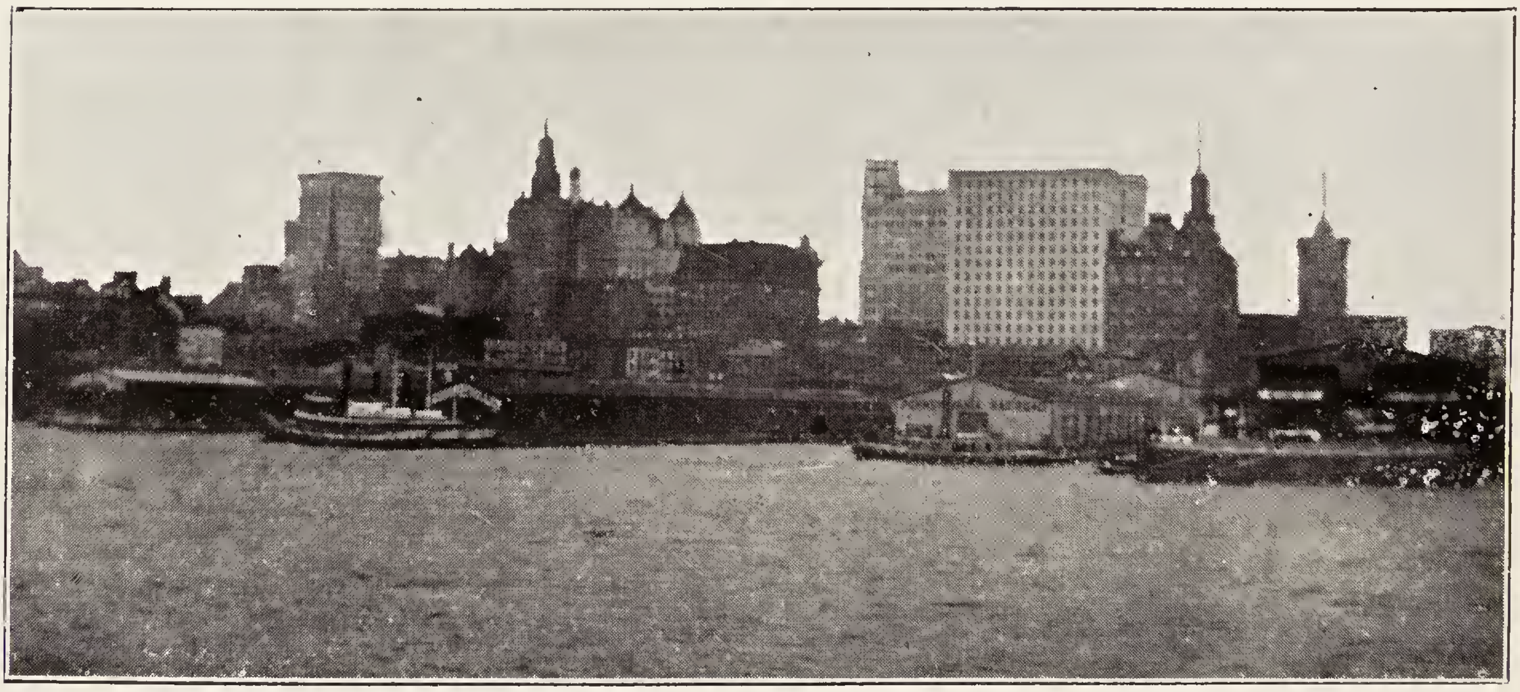
> "I have to state that the apparatus erected by you six years ago is working in a satisfactory manner. We have never had the slightest trouble with it in any form. This Lift is inspected once per month only.

Adams' Patent Sewage Lifts.

HOTEL BASEMENTS AS RESTAURANTS, &C.

On the Seine, Paris—Ritz Hotel Lift, and others.

BASEMENTS USED AS LAVATORIES, &C.

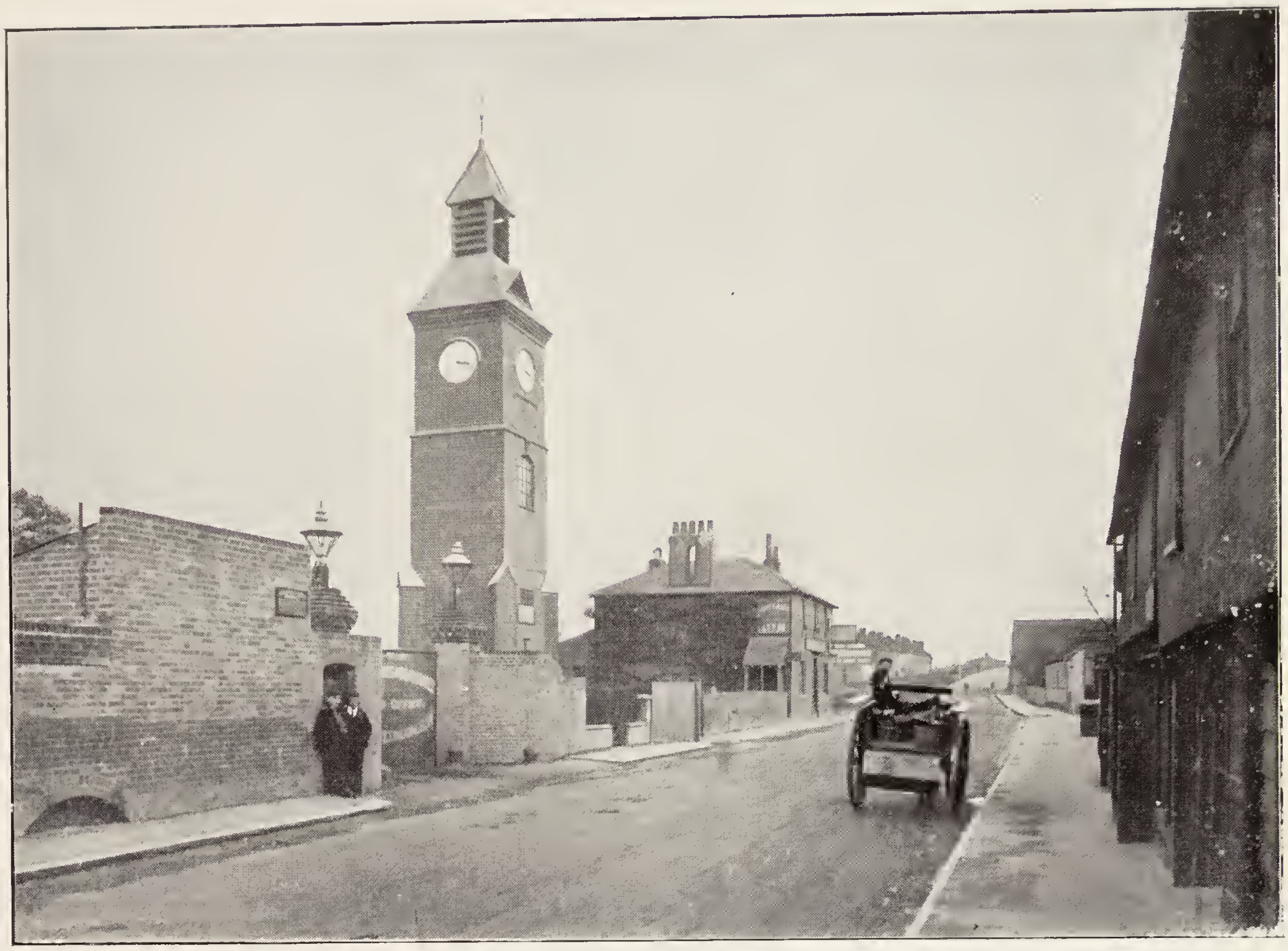


IN the Sky-scrapers of New York, U.S.A., and in London, &c., &c.

W. N. COLAM, Esq., M.I.C.E., Edinburgh and London:—

> "The apparatus works to our entire satisfaction. As an automatic pump it appears to me to be working as nearly as possible on the principle of work done at no cost. Its great charm is its simplicity and absence of moving parts."

Adams' Patent Sewage Lifts.



Sewage Lift and Clock Tower, Crayford (Main Street).

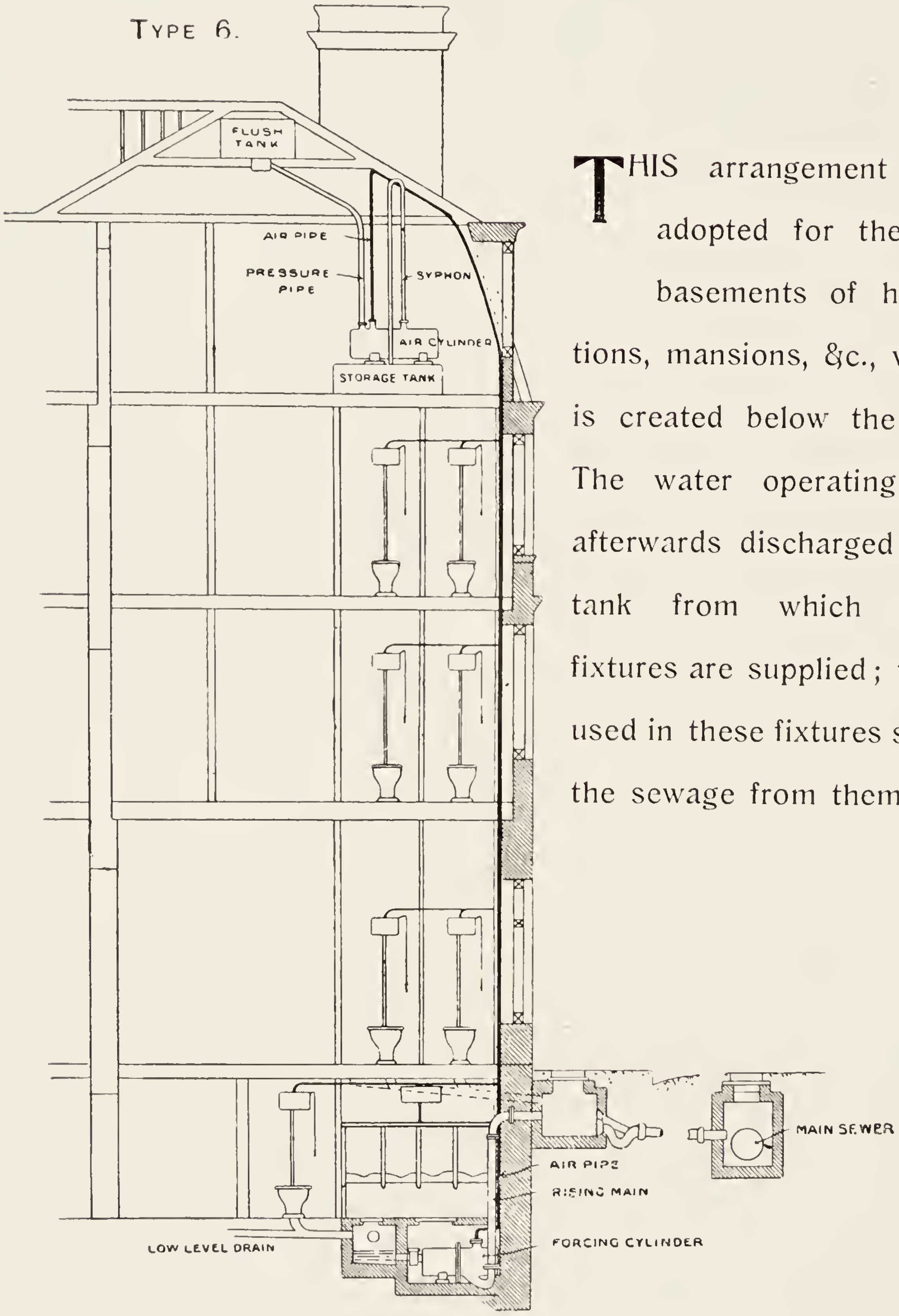
WHERE the gradients permit of it, the Sewage Lift Chambers are placed entirely below ground. In such a case, sewage is invariably used to operate the Lift. In some instances—as at Crayford, etc.—it is necessary to construct a tower in which the Flush Tank and Air Cylinder may be placed.

ERNEST J. ELFORD, Esq., Borough Engineer, Portland, says:

> "In reply to your inquiry, I have pleasure in stating that they (the Lifts) have given the greatest satisfaction. The Lift which is worked by sewage costs practically nothing. The other Lift which is worked by water, also gives excellent results, and I should not hesitate to adopt your apparatus whenever the conditions are suitable."

Adams' Patent Sewage Lifts.

Type 6.



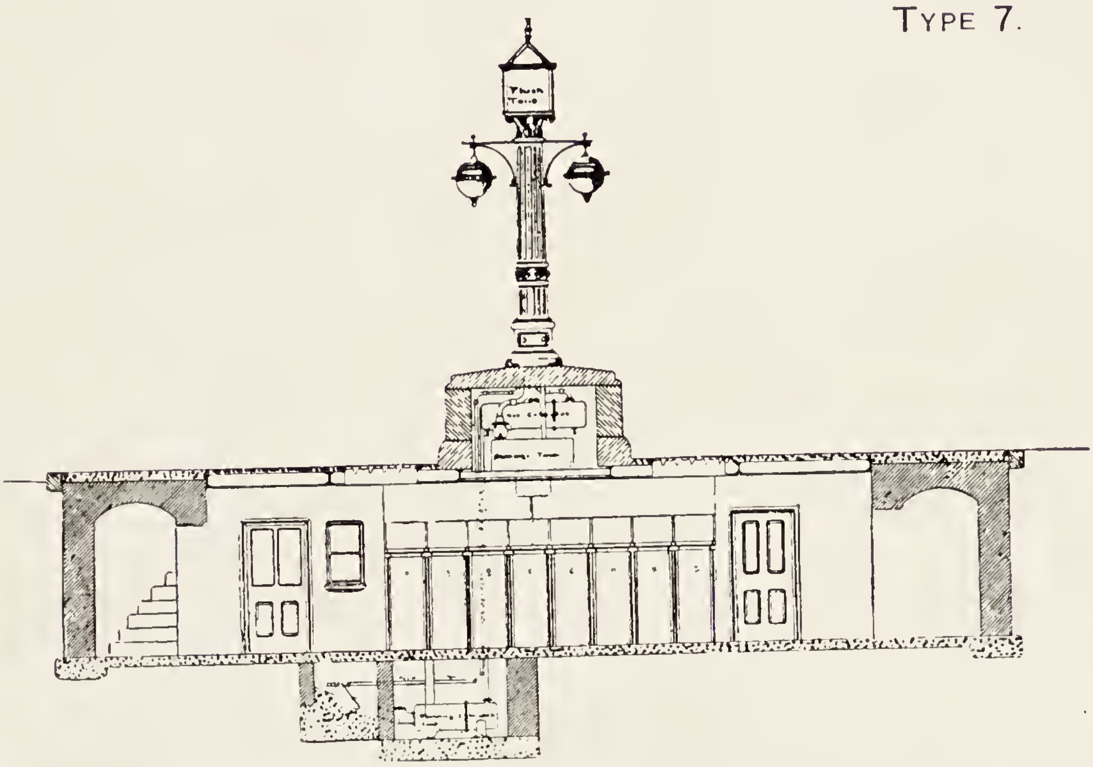
THIS arrangement is generally adopted for the drainage of basements of hotels, institutions, mansions, &c., where sewage is created below the sewer level. The water operating the Lift is afterwards discharged to a storage tank from which the sanitary fixtures are supplied; thus the water used in these fixtures serves to raise the sewage from them free of cost.

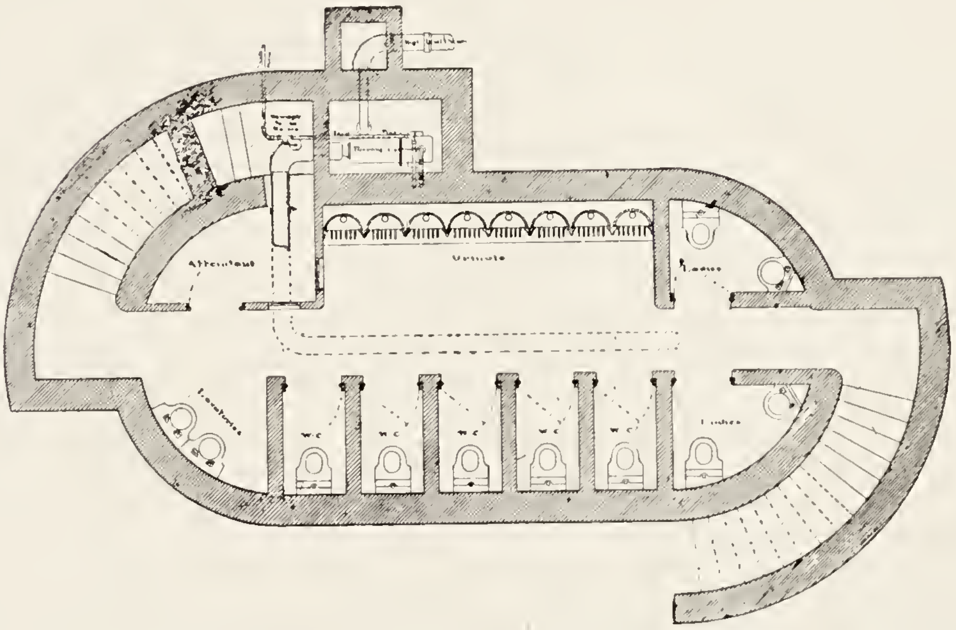
ADAMSEZ. LTD., SCOTSWOOD-ON-TYNE, OLD QUEEN STREET, WESTMINSTER, LONDON, MANCHESTER, GLASGOW, &c., &c., are producing at their newly-acquired Fireclay Works at Scotswood-on-Tyne, every variety of Sanitary Apparatus for Schools or for Domestic Work, Fireplaces and Art Tiles, and Garden Vases, Fountains, Sundials, &c.

Adams' Patent Sewage Lifts.

UNDERGROUND CONVENIENCES.

TYPE 7.



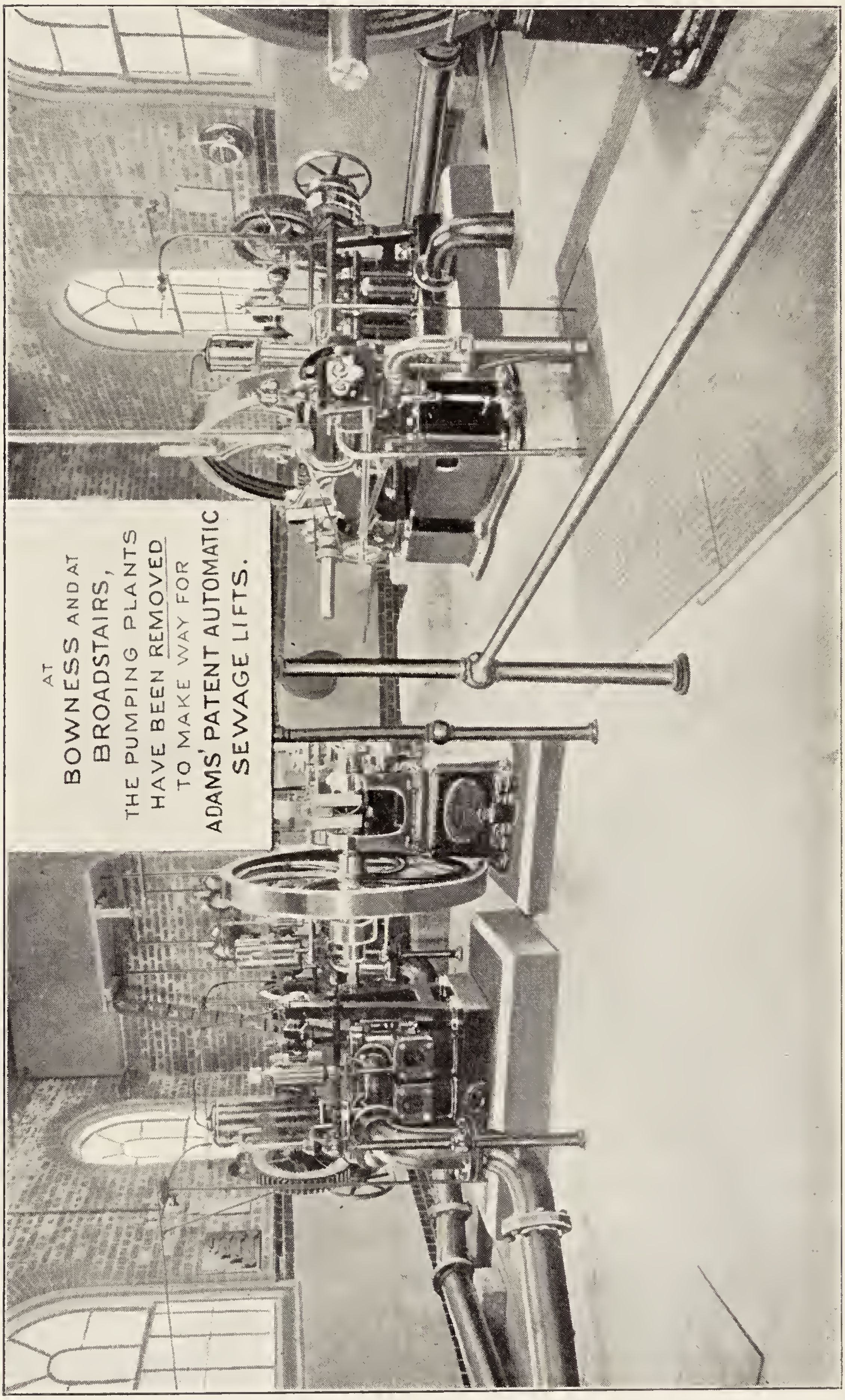


THE Sewage Lift as shewn here raises sewage created below to the sewer above. The use of the Lift thus enables Engineers to construct Underground Conveniences where otherwise this would be impossible. The apparatus is entirely Automatic. The cost of water is reduced by its use (after passage through the Lift) in the conveniences for operating the sanitary appliances, etc.

A. R. ROBINSON, Esq., Clacton-on-Sea, says:—

> "I have every reason to be satisfied with the working of the two Sewage Lifts, which you installed here for the purpose of lifting sewage from the underground Conveniences. They have been working now for four years, and have given no trouble, and have so far cost practically nothing for repairs."

Adams' Patent Sewage Lifts.



Interior of a Pumping Station, Engines and Pumps in Duplicate.
The WHOLE of these moving parts are abolished where ADAMS' PATENT SEWAGE LIFTS are used, and Pumping is done without cost.

Adams' Patent Automatic Sewage Lifts.

COMMERCIAL CABLE BUILDINGS, NEW YORK.
Drained by Adams' Patent Lift.

GRAND PRIX and GOLD MEDAL, PARIS, 1900.

THOMAS FOSTER, Esq., Surveyor, Hoylake :—

"I have to state that the apparatus erected by you six years ago is working in a satisfactory manner. We have never had the slightest trouble with it in any form."—This Lift is inspected once per month only.

Mr. J. CRANSTON, Engineer, New York, U.S.A. :—

"It has stood a severe test and has gone along and performed its work without annoyance or trouble to us, and I think it is as near a fool proof appliance as can be constructed."

THE ARCHITECT TO THE FRENCH GOVERNMENT :—

"The Sewage Lifts were installed in May, 1898, and have worked continuously without trouble or oversight in the most satisfactory manner."

Mr. JEAN MARQUET, Architect for the Principality of Monaco :—

"I certify that the Adams' Patent Automatic Sewage Lift has worked continuously without trouble or oversight in the most satisfactory manner."

W. N. COLAM, Esq., M.I.C.E., Victoria Street, S.W. :—

"The apparatus fitted up by you has been working to our entire satisfaction and with great economy. As an automatic pump it appears to me to be working as nearly as possible on the principle of work done without cost. Its great charm is its simplicity and absence of working parts."

Messrs. STEVENSON & BURSTAL, Civil Engineers, Westminster, S.W. :—

"We have much pleasure in certifying to the value of your Automatic Sewage Lift in districts suitable for its installation, such as Douglas (Isle of Man). We inspected the Lift there a short time ago and found it working satisfactorily—so much so, that the Corporation have decided to put in other three sets. The work as carried out by you is most satisfactory"

HERBERT HEAPS, Esq., Deputy Borough Engineer, Grimsby :—

"The Sewage Lift purchased by this Authority from you six years ago has given every satisfaction. During the whole time the apparatus has been at work we have not expended any moneys for attendance or repair."

BACTERIAL SECTION.

SYSTEMS:

CONTACT,
DOSING,
STREAMING,
NEW MULTIPLE,
CONTINUOUS,
SPRAYING.

ADAMS-HYDRAULICS, Engineers,
Works: YORK and SCOTSWOOD-ON-TYNE.
London Office: 7, OLD QUEEN STREET, WESTMINSTER, S.W.;
BOTHWELL STREET, GLASGOW;
ALBERT SQUARE, MANCHESTER, etc., etc.

Sewage Disposal, etc.

"Sweet Water for Bitter."

Sewage Disposal.

THE Bacterial Purification of Sewage may be effected either upon Contact Beds—in which the Sewage is held in contact with the filtrant for a given length of time and then discharged—or upon continuous filters so called. In the latter the liquid is discharged upon the surface of a bed through which it passes, being purified in transit. The continuous system is of value where the depth available is sufficient.* The contact system is of value where the depth is insufficient for the continuous, and where sewage is very intractable. The choice of systems must depend upon local conditions entirely.

The following notes deal with all types of Bacterial Disposal Schemes. Particular attention should be given to the description of the New Multiple System, by means of which shallow beds may be made to give an effluent unequalled by that obtained in any other manner, and to the later developments in Continuous Filtration and Septic Tanks, etc.

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* See The Local Government Board Requirements for 1903.

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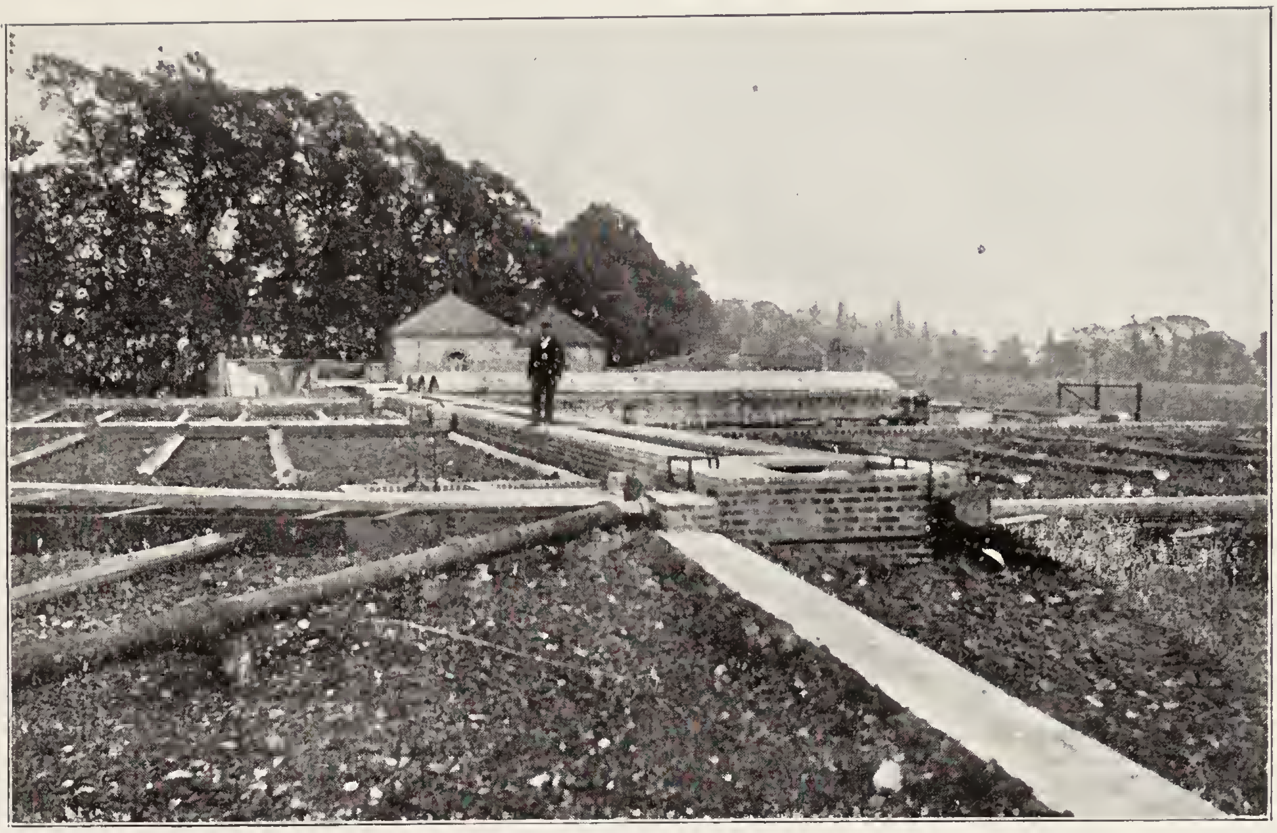
Fleet Street, London.

Sewage Disposal, etc.

THE FIRST BACTERIA BEDS.



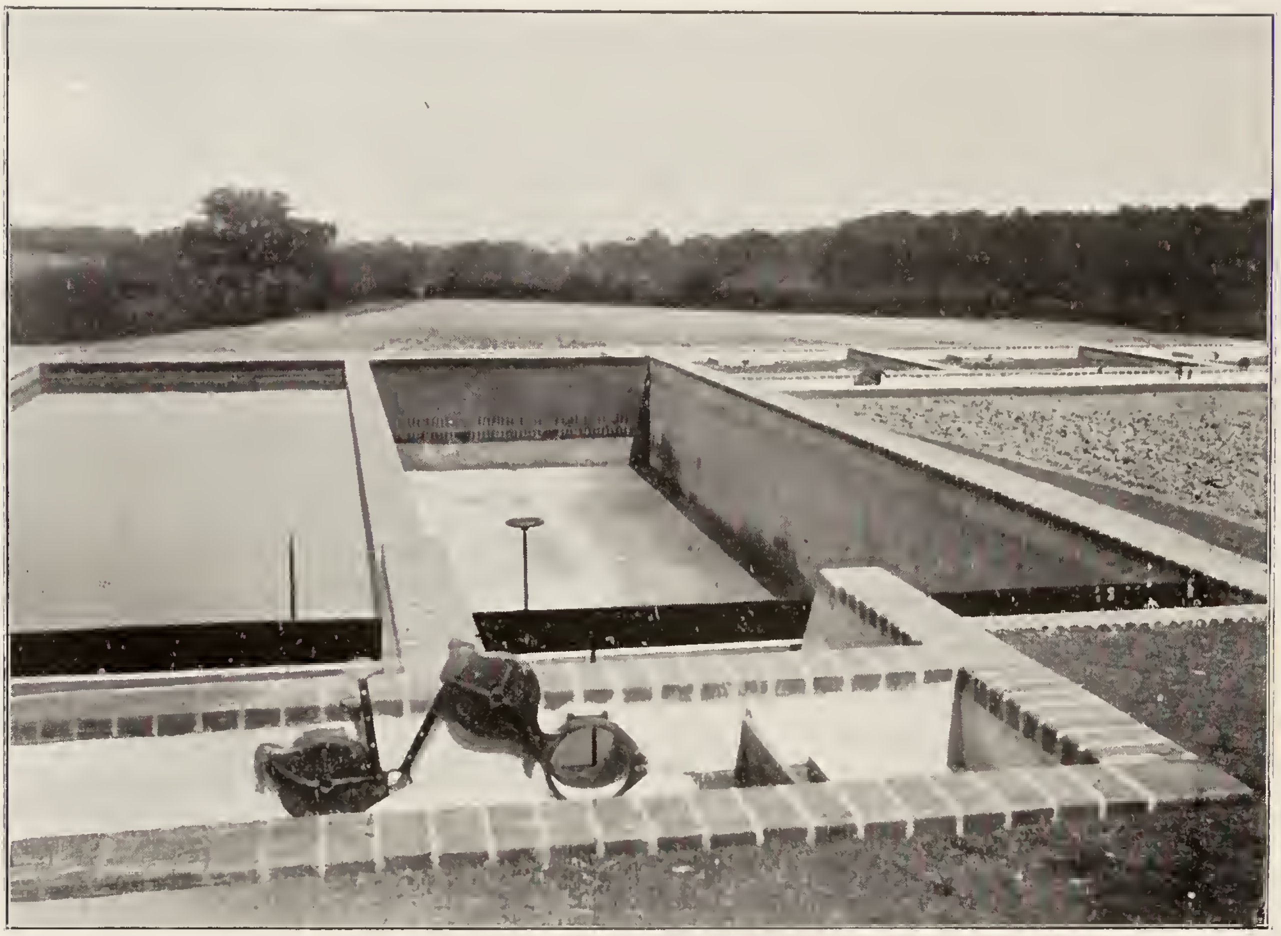
View of the Sutton Bacteria Beds.

THE first Bacteria Beds were laid down at Sutton, Surrey, by Mr. DIBDIN, in 1895 (following his Barking experiments), the use of chemicals was abandoned in favour of biological methods, an improved effluent and a marked decrease in expenditure resulting. The sewage of the entire town is now treated thus; it is delivered direct from the sewer to a series of scum tanks (seen in the distance), and thence to the beds; the latter are operated by our Automatic Syphonic Apparatus.

Mr. C. CHAMBERS SMITH, the Council's Engineer, states that the use of this Apparatus has produced a more satisfactory effluent than that obtained under the old regime, where manual control was relied upon. The beds are of various depths, from 3 to 5 feet. The filtrant remains unchanged in some of the older beds (after about 7 years continuous use).

A visit to these works—the oldest in operation—will afford much help to those interested in bacterial methods of disposal.

Sewage Disposal, etc.



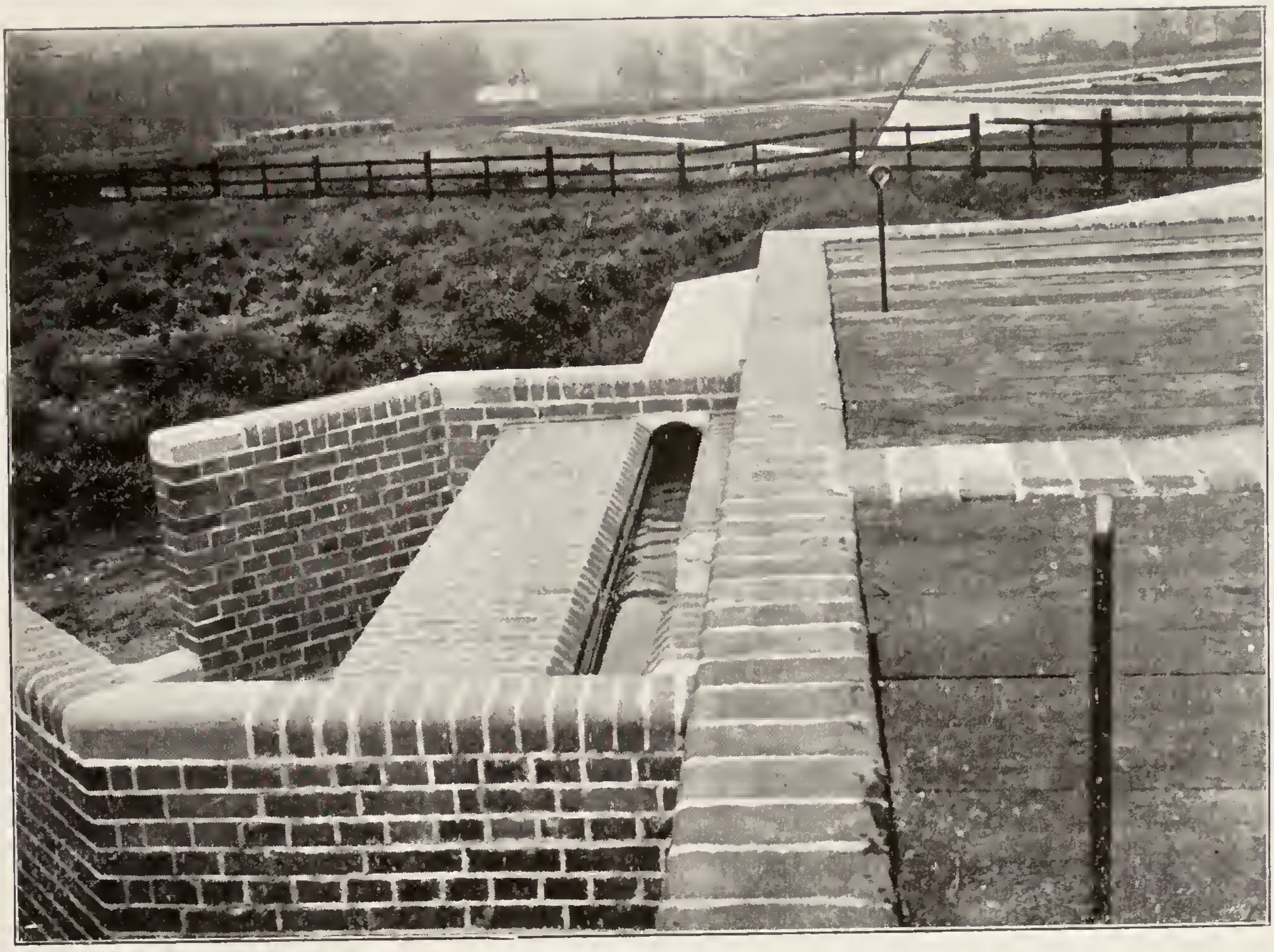
THE production of a good tank effluent is the first step towards purification. The septic or scum tank is a receptacle in which the liquefaction of soluble matter takes place. In order to achieve the desired result the tank should have usually a capacity equal to the dry weather daily flow—for Institutions, Mansions, &c. tanks should contain twice this amount. It is evident that only soluble substances will be taken up into solution, and that there will be, sooner or later, a certain amount of grit or sludge to remove—for this reason scum tanks should be divided in their length, that one or other compartment may be used when cleansing, etc. The flow should be from end to end. The liquid should enter over a weir, passing under a scum plate—finding exit under a scum plate and over a weir. The tanks may be either covered or open.

* By the requirements of the Local Government Board, a volume of sewage equalling three times the daily dry weather flow, must be treated upon a filter, whilst an additional three volumes—making six in all, must be dealt with upon a separate storm-water area. This excess over three must be diverted by means of a storm overflow.

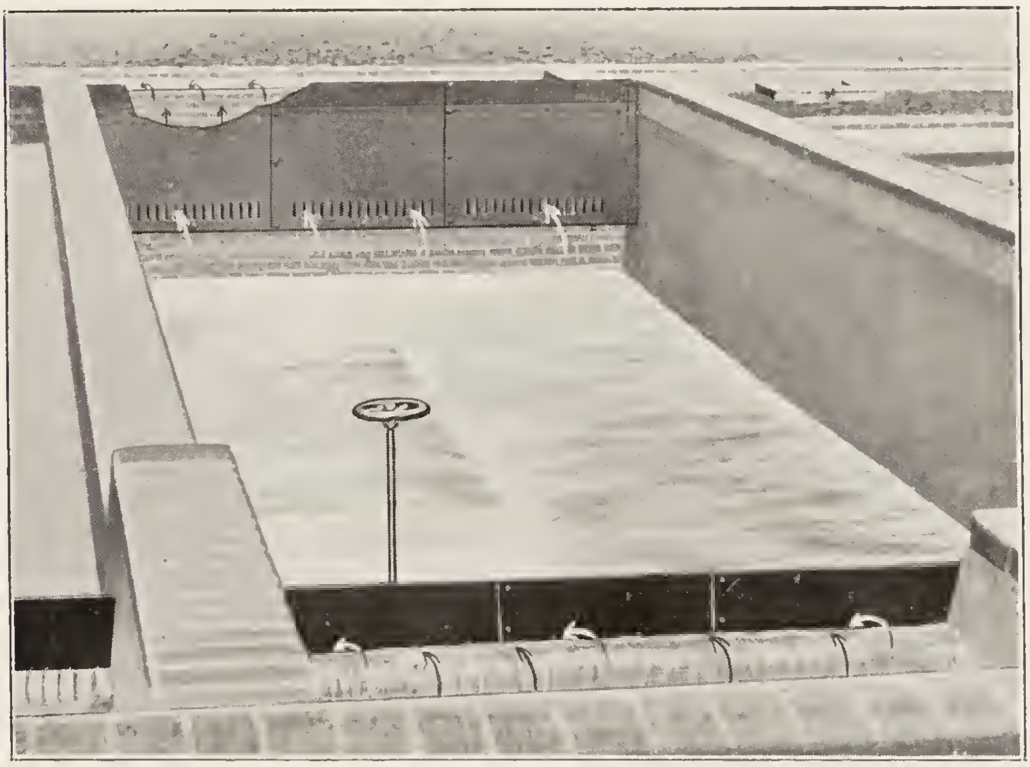
The view shews a divided septic or scum tank with patent scum plates and weirs at inlet and outlet, and storm overflow at right hand—disc valves for admitting sewage to the tank (one division of which is full), and sludge plugs for drawing off sludge. The Bacteria Beds are seen in the distance.

* Relaxed under certain conditions.

Sewage Disposal, etc.



THIS illustration shews another type of storm overflow. Excess liquid (above the three volumes) will rise and flow over the brick weir, the remainder passing to the beds—seen in the distance. The sewage tanks on the right are wood covered.

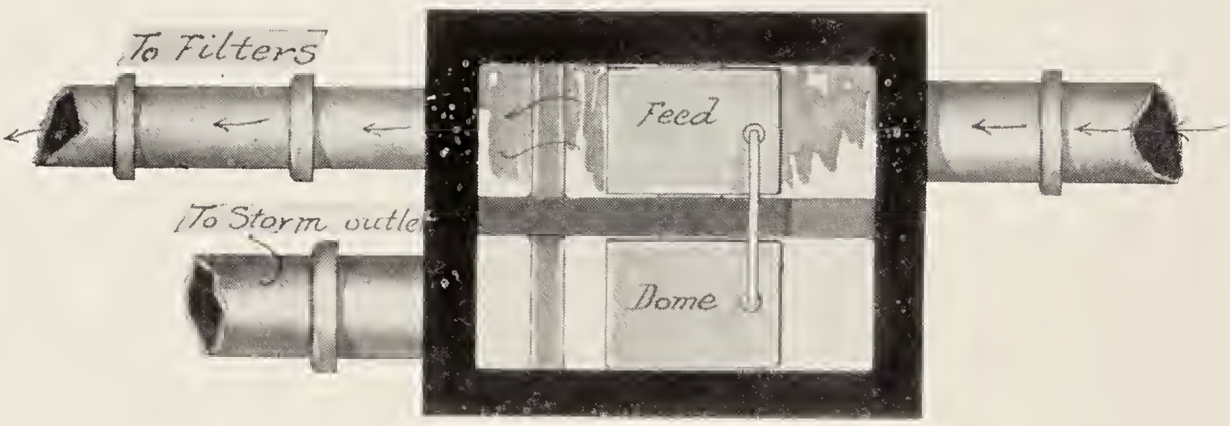


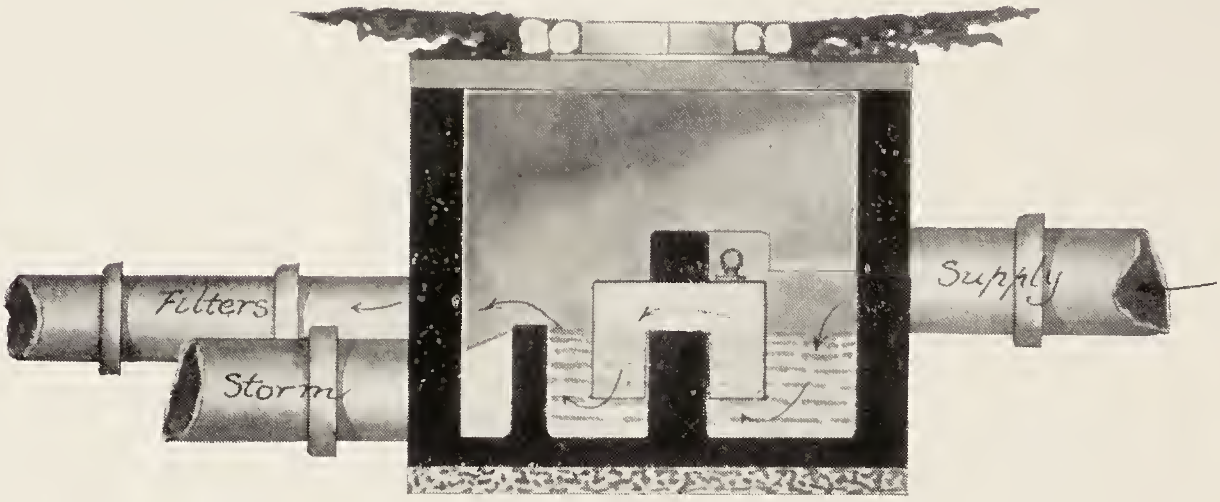
VIEW shewing the patent scum plates. It will be seen that the sewage enters the sedimentation tank (shewn empty) over a weir, passing through the slotted scum plates, and that its exit is through similar plates and over a weir. This arrangement ensures the equal distribution of the incoming sewage, prevents wire drawing, and is a very material aid in producing a good tank effluent.

Sewage Disposal, etc.

WHERE desired the entire volume may in time of storm be sent direct to the stream, etc. The apparatus illustrated and described below may be used for this purpose.

ADAMS' PATENT STORM-WATER DIVERTER.





THIS apparatus passes the normal supply, but automatically closes against an excess volume. The entire amount is then discharged through the storm outlet—either direct to the river or to the storm-water filters. The use of this apparatus not only protects the sewage filters in time of flood from overwork, but gives them an absolute rest at a time when no treatment is necessary.

AN ADAPTATION of the apparatus is also used to divert the flow of sewage, after the lapse of a desired time, to another outlet—as in the separate system, from the sewers to the surface water drains, etc.

Sewage Disposal, etc.

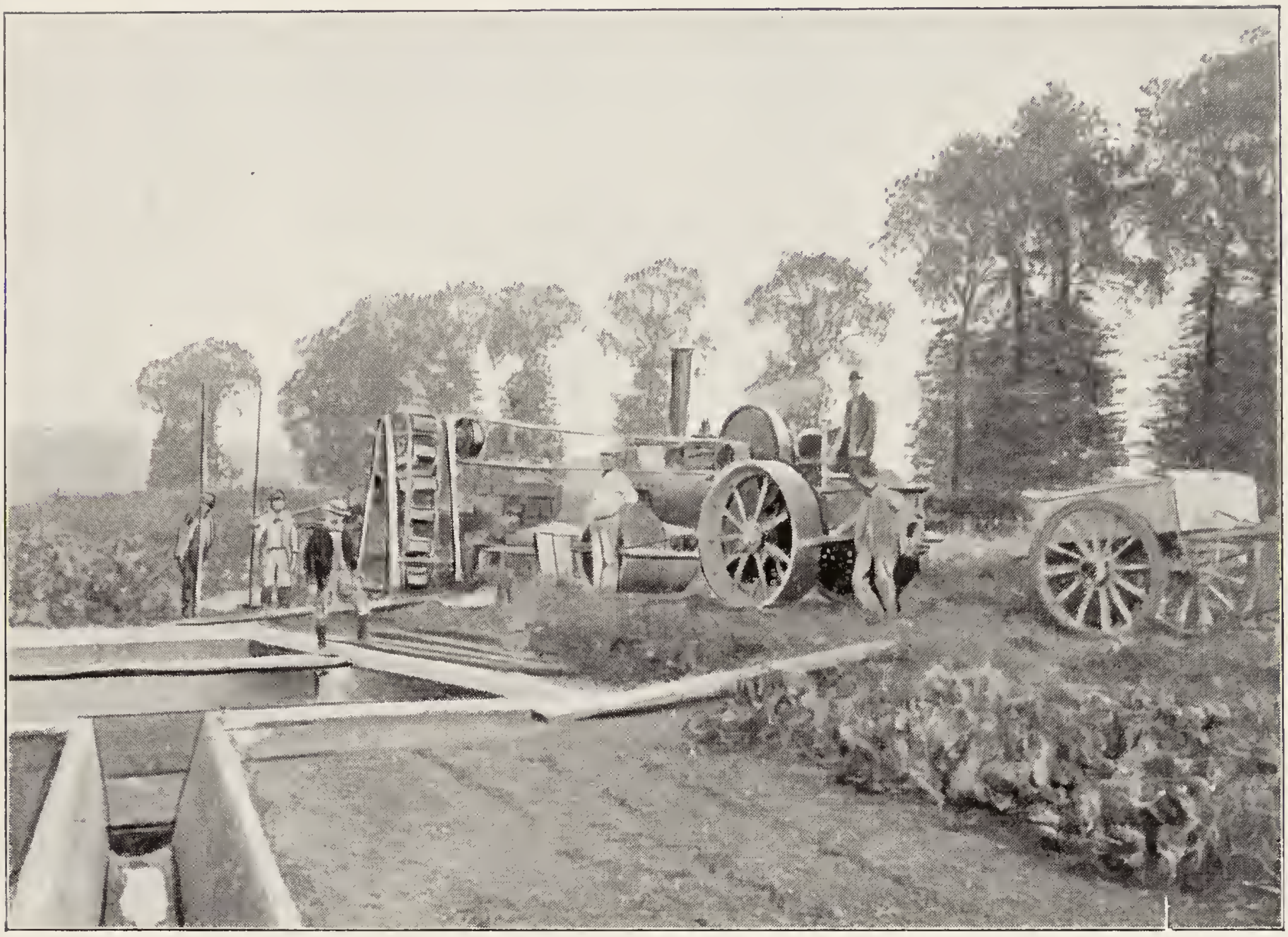


Fig. BA.—Dredger Removing Sand and Detritus.

IN no case must sand, or other similar substance, be allowed to pass to a bed. Where a large amount of this is liable to be brought down with the sewage, the construction of a suitable catch pit becomes a necessity. The view shews such a catch pit, and the apparatus employed to empty it; as seen, the dredger is driven by a road roller, which is brought down to the site as occasion requires. The dredger buckets are of steel, the endless chains to which they are attached travel upon suitable pulleys, the whole being supported within a strong cast iron frame.

Where larger obstructions are expected a Screen should be used.

At Fig. BB. (next page) Adams' Patent Screen is shown in operation. The basket is formed with a hinged front, which falls when in position, allowing matter to flow freely into it. When raised, the front is closed by the slack chain and the whole is drawn to the surface, the guard screen having first dropped to the lower position.

Sewage Disposal, etc.

SEWAGE SCREENS, etc.

ADAMS' PATENT SCREENS.

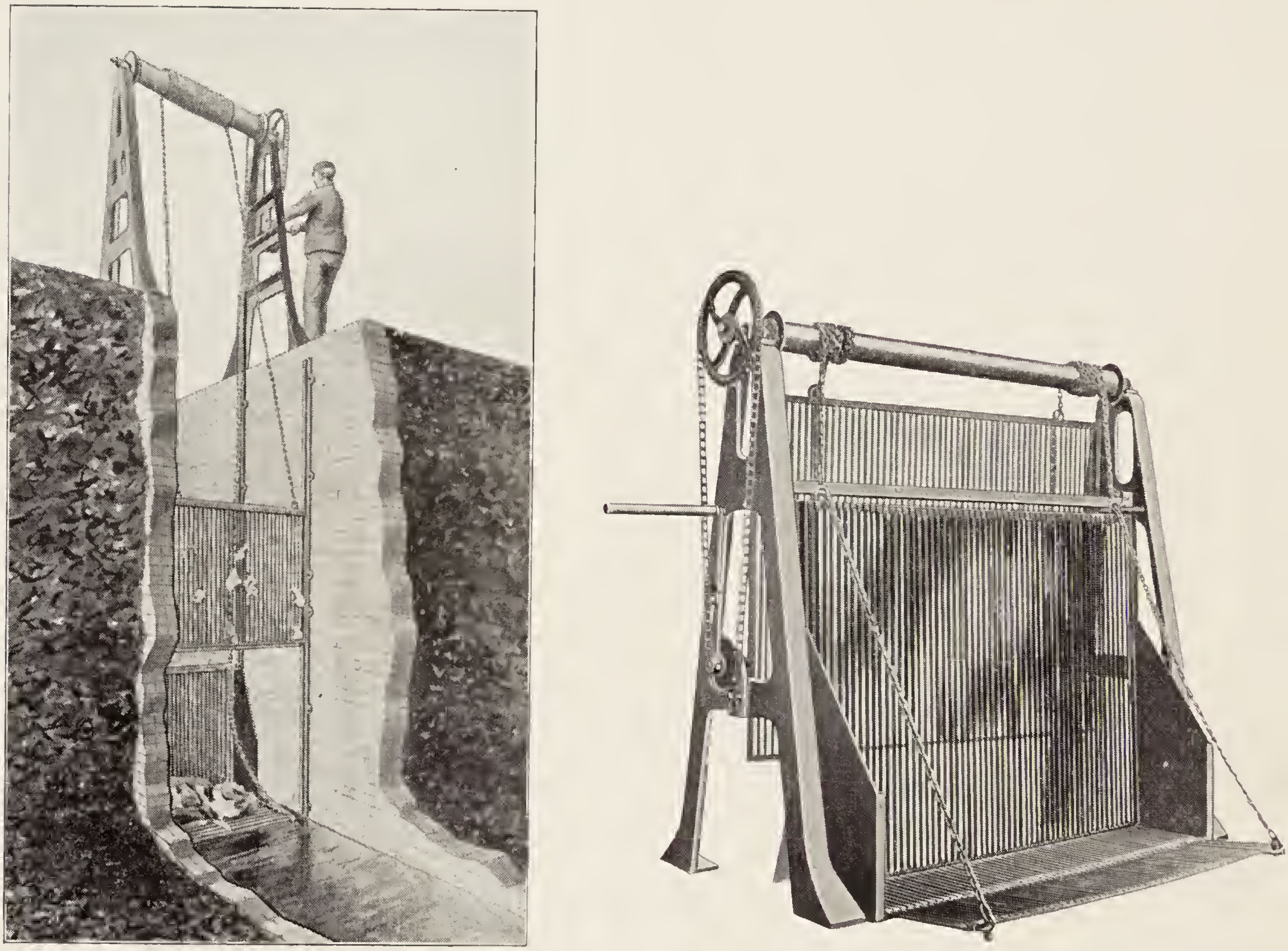


Fig. Bb.

THIS Screen has a catch basket of its total width. The front of the basket falls when in position to allow entry of larger substances. The first movement of the handle closes this basket, which then lifts with the screen—at the same time the back screen falls into the place formerly held by the other. The screens slide in guide bars bolted to the masonry below.

Sewage Disposal, etc.

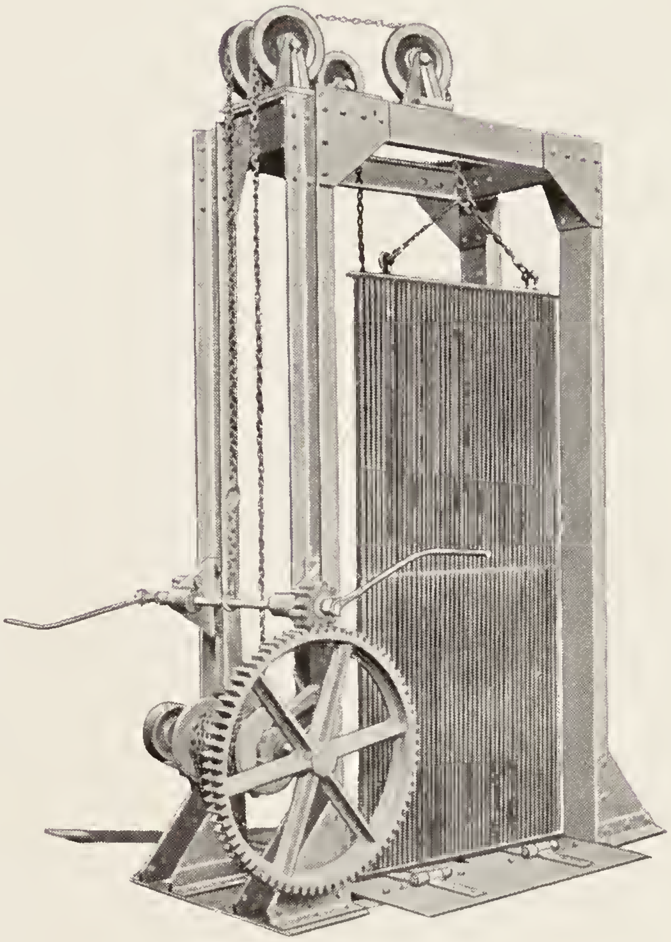


Fig. BA.

SHEWS a simple Drop Screen with its Lifting Gear. The screen works in slide bars bolted to the masonry below.

For estimates give width and depth required.

Messrs. Heaton, Ralph & Heaton, Civil Engineers, Wigan:—

> "The Syphons you have fixed at the discharging ends of the filter beds for the Abram Urban District Council entirely empty the beds, and the entire automatic installation you have provided for filling and discharging the eighteen beds is working most satisfactorily."

Sewage Disposal, etc.

AUTOMATIC FILLING OF BEDS.

VARIOUS mechanical devices are used for operating bacteria beds—it must be apparent that the simplest apparatus is the best, and that syphonic apparatus is the simplest—An adaptation of the syphon fills the beds shewn, whilst another type of syphon is used to discharge the beds.

The principle employed in the Air-lock Feeds is shewn very well on opposite page. Figs. 1 and 2 are lettered to correspond. 'A' is the sewage supply channel, 'B' the automatic air-lock feed, 'C' an air-pipe connecting it with dome 'D.' Sewage passes freely from the channel through the apparatus, and is distributed by the trough 'G' to the bed. The wall 'F' serves as a screen around dome 'D.' At Fig. 1, the liquid level 'E' is below bottom of dome 'D'; no air-lock exists; this level rises, as the bed fills, until (see Fig. 2) the dome 'D' is reached. The air within is put under a pressure due to the still rising liquid, until finally, when the full height 'E' is reached, the air from dome is transferred through the pipe 'C' to the interior of feed 'B,' where it creates an air-lock, which cuts off the further supply of sewage, and the bed rests for saturation. The arrows on white ground, within 'B' and 'D,' shew the space occupied by air under pressure. The feed is unlocked to the passage of liquid when the air within it is allowed to escape; the escape is brought about by an added volume from a dome placed in any desired bed, bursting the seal of the main trap, or an auxiliary water seal.

CAPACITY OF STOCK SIZE FEEDS.

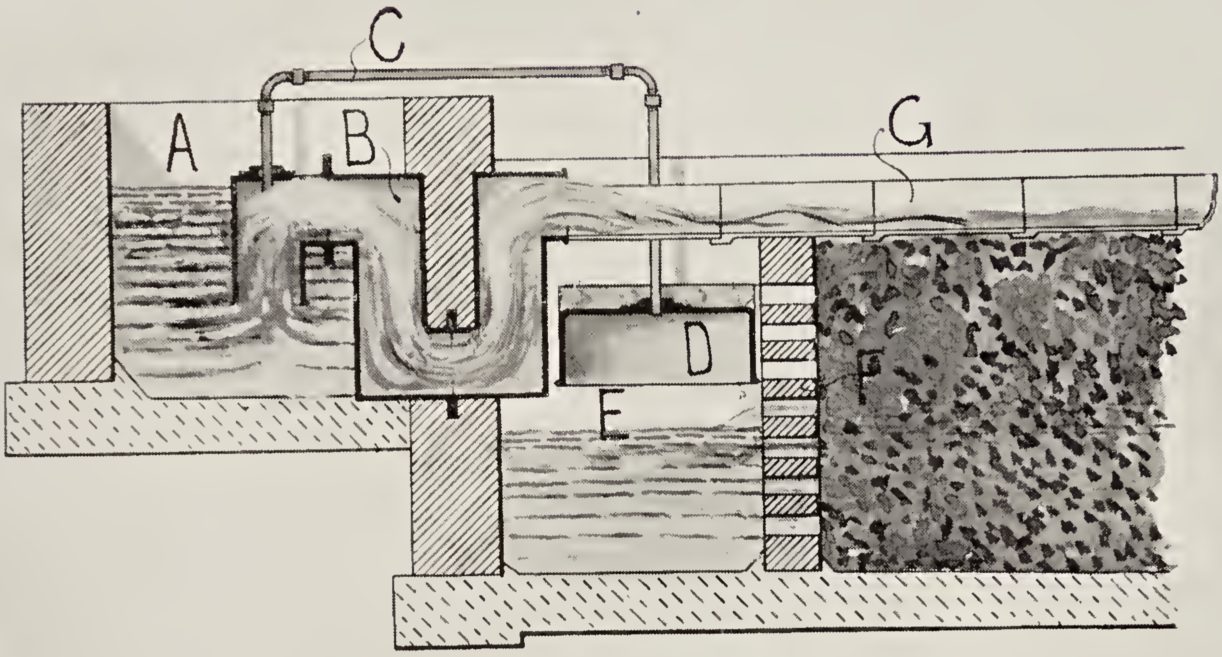
	Gallons per minute.	Gallons per hour.
No. 1	48	2880
2	70	4200
3	195	11700
4	382	22920
5	631	37860
6	1120	67200
7	1520	91200
8	2520	151200

Special Feeds are made to suit varying conditions, and any number may be connected.

STORM WATER DIVERSION.—The above apparatus may be used also to divert sewage, in case of flood, to the storm water area; it is open to a normal flow, closing automatically to an excess flow, which then passes off by the storm outlet.

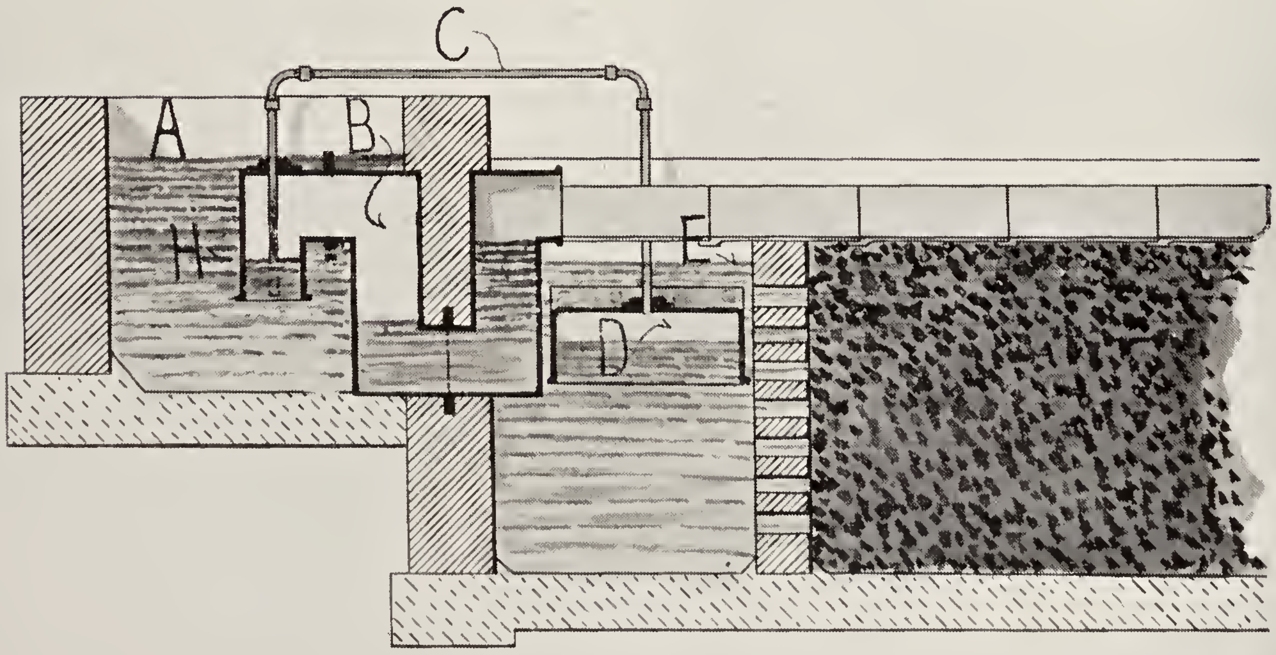
ADAMS' PATENT AIR-LOCK FEED.

FIG. 1



Feed Open—Bed Filling.

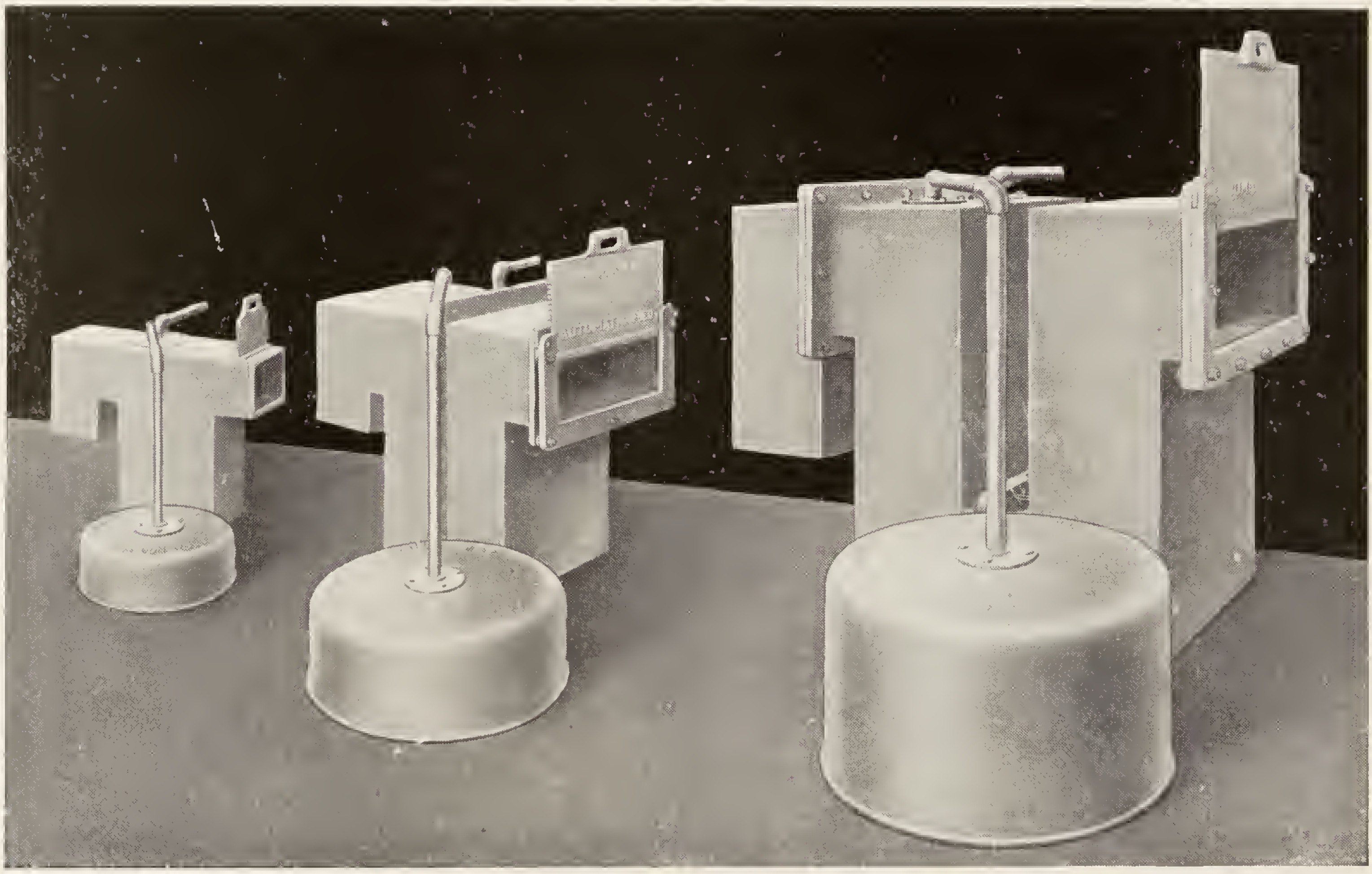
FIG. 2



Feed Shut—Bed Full and Standing.

Sewage Disposal, etc.

AUTOMATIC FILLING OF BEDS.



Adams' Patent Automatic Air Lock.—(Air Controlled Feed Apparatus).

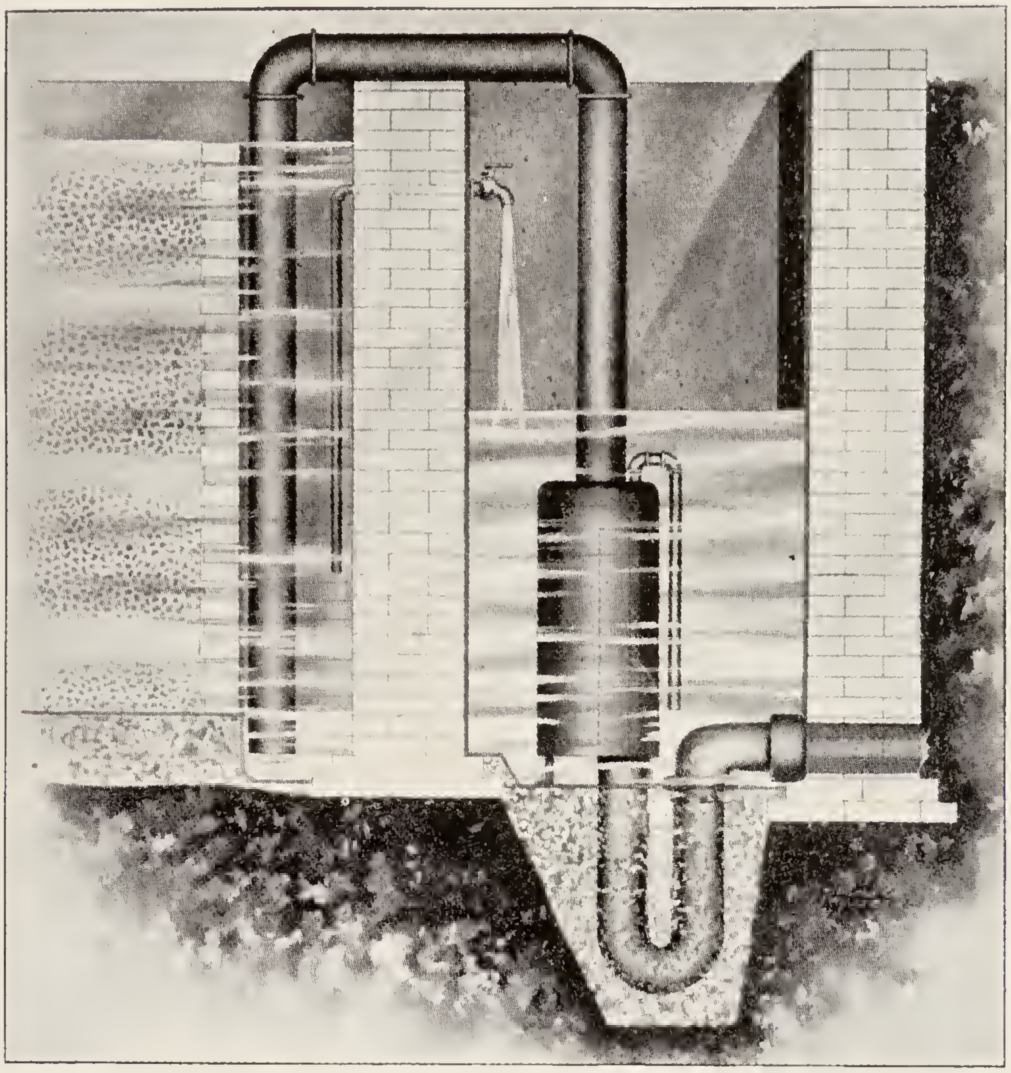
THE construction of the Apparatus is shewn above. Each feed has its Air Dome attached; it will be readily seen that the transfer of air from the latter to the interior of apparatus would create an air lock, which the supply of sewage unaided could not break. Hand sluices are provided for shutting a bed permanently down, if required; these must be left open when the beds are working automatically. For full description, see last page.

STORM WATER DIVERSION.—The above apparatus may be used also to divert sewage, in case of flood, to the storm water area, it is open to a normal flow, closing automatically to an excess flow, which then passes off by the storm outlet.

Sewage Disposal, etc.

ADAMS' PATENT TIMED SYPHONS

(Automatic Emptying of Beds.)

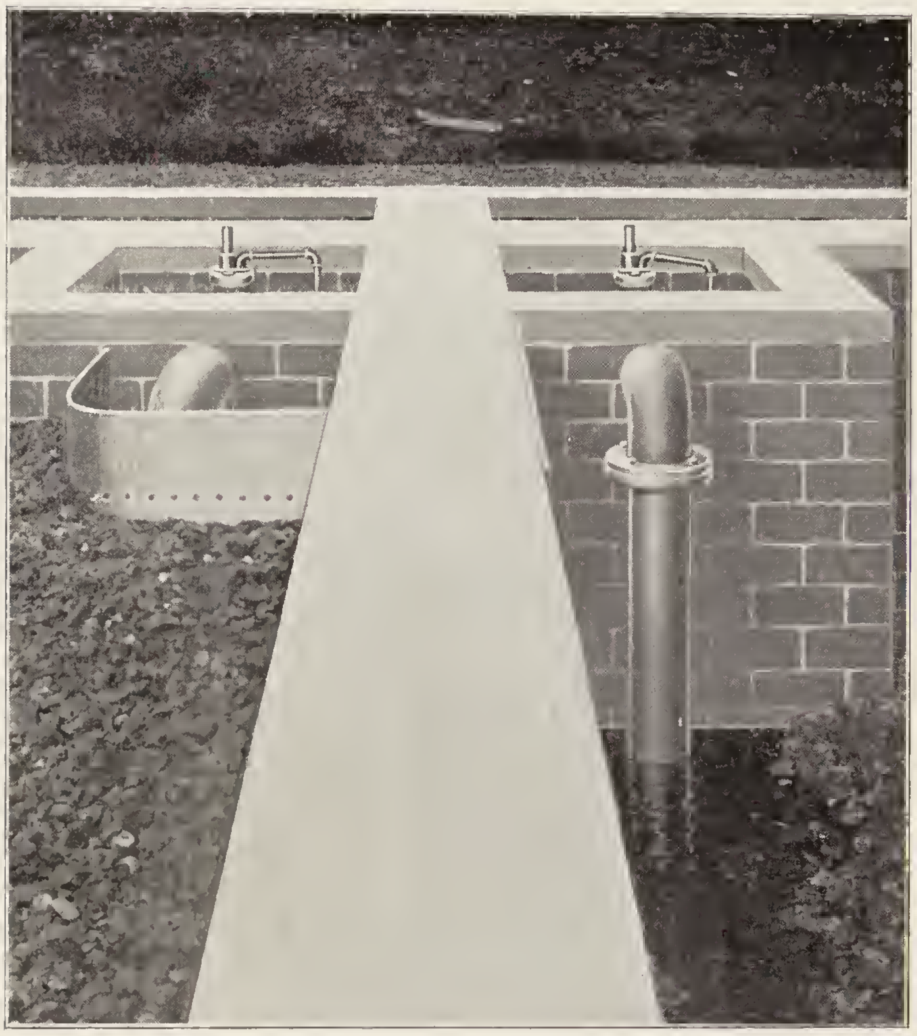


Adams' Patent Timed Syphon, Fig. 74.

THE above apparatus for the Automatic Emptying of Beds is extremely simple. As will be seen the syphon proper is placed within a flushing tank—the latter receives its liquid supply from the bed (through a stop-cock). The syphon has an overdraw pipe which dips into the contact bed—through this (when the syphon proper starts) the liquid contents of the bed are drawn over to the flush tank and discharged by the main syphon. The time taken to fill flush tank governs the time of contact. The beds are entirely drained, the syphon has no moving parts, and cannot become deranged.

Our Syphons have operated for ten years continuously without attention.

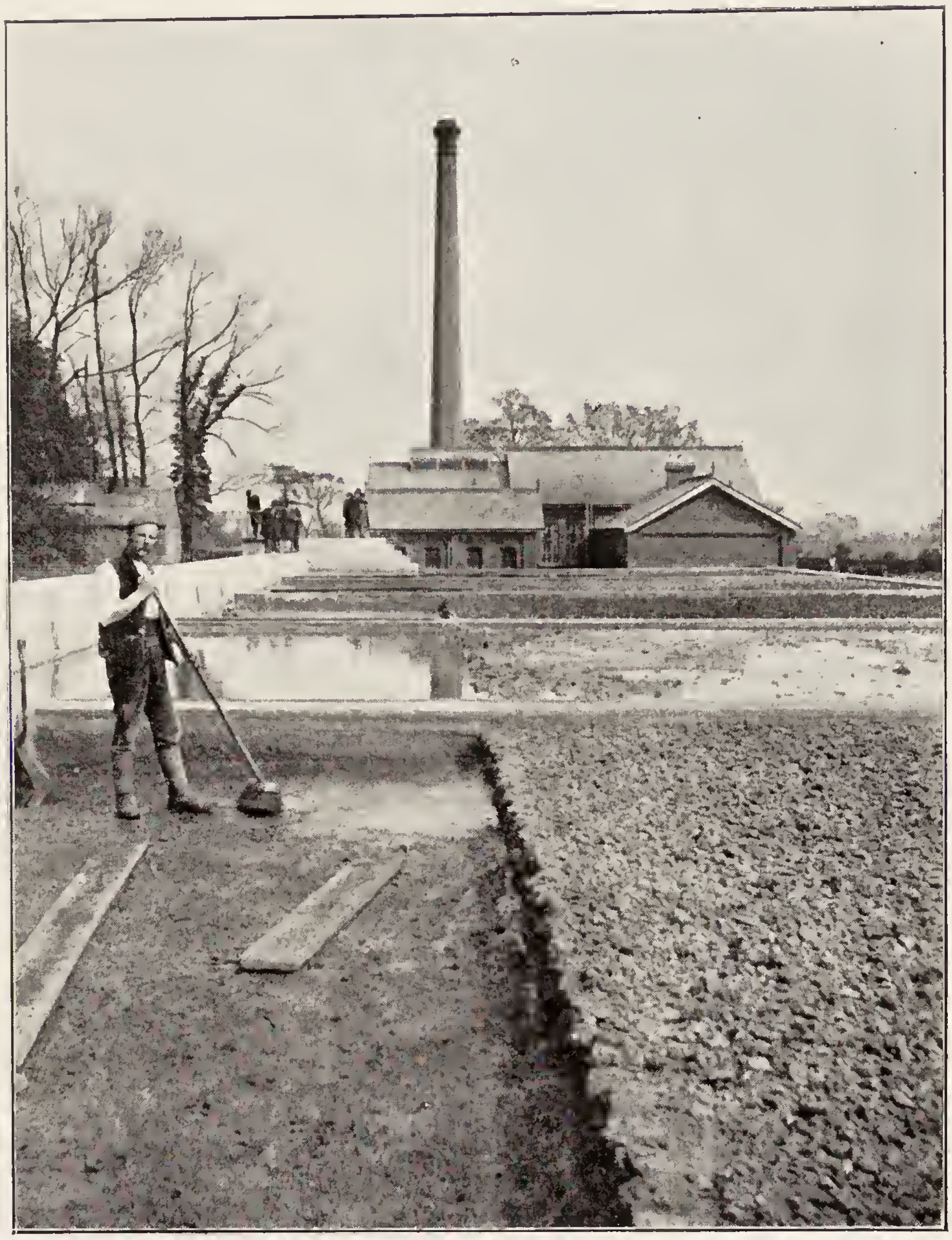
Sewage Disposal, etc.



Timed Discharge Syphons.

THIS view shews the division wall between two beds. The left hand bed is completed. The perforated iron screen around syphon overdraw pipe allows the liquid to pass to the syphon, but holds back the filtering material. The bed at right hand side is partially filled only. It shews the overdraw pipe with the screen removed. A contact bed may be of any desired depth from 18 ins. upwards (3 ft. or thereabouts is a convenient and usual depth). Primary, secondary, or tertiary contact may be used, this means with ordinary contact beds, a considerable depth. With our New Multiple Contact System the same result is obtained in the depth of a single contact bed. Thus any degree of purification may be obtained without loss of depth. For description see later pages.

Sewage Disposal, etc.



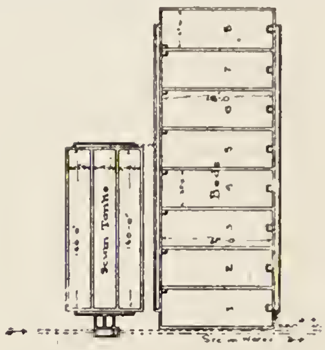
IT IS undoubtedly wise, if not absolutely essential, to use the prior liquefaction tank, otherwise the sludging up of the filter will certainly result. The view shews a case where the tank has been omitted and an endeavour is made to collect the sludge upon a part of the first contact beds, from which it is periodically removed.

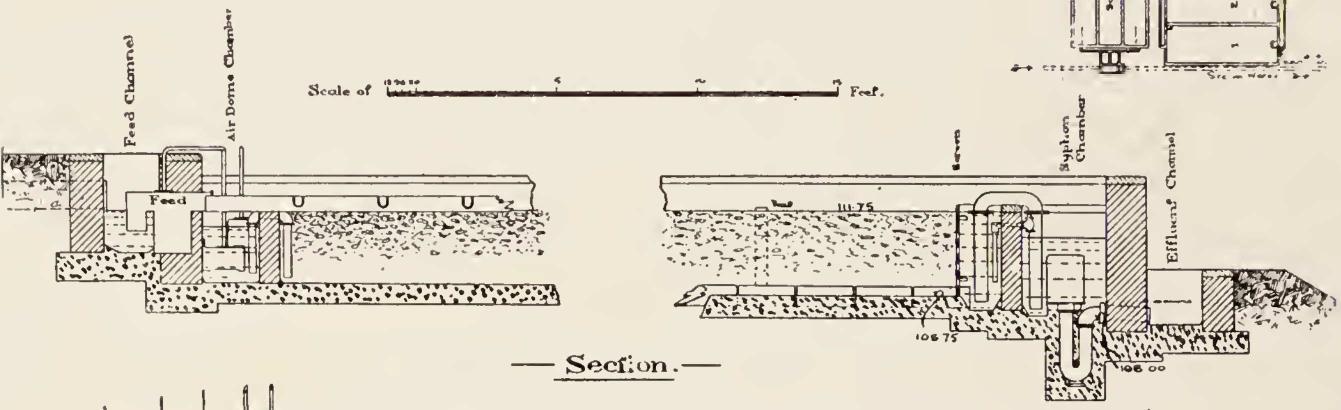
In operating bacteria beds, the Local Government Board requires storage to be provided for the night flow, unless automatic apparatus is used (in which case the storage is dispensed with). We have always advocated the use of syphons for emptying and filling beds, because they have no working parts. Our syphons have been in continuous use for ten years without repair or renewal. It is apparent that mechanical gear would have cost much for repairs and attention, if not for actual renewal during that period.

Type O—Single Contact.

DETAILS OF ADAMS' PATENT AUTOMATIC APPARATUS FOR BACTERIA BEDS.

KEY PLAN.
Scale 1/50"·1 foot.





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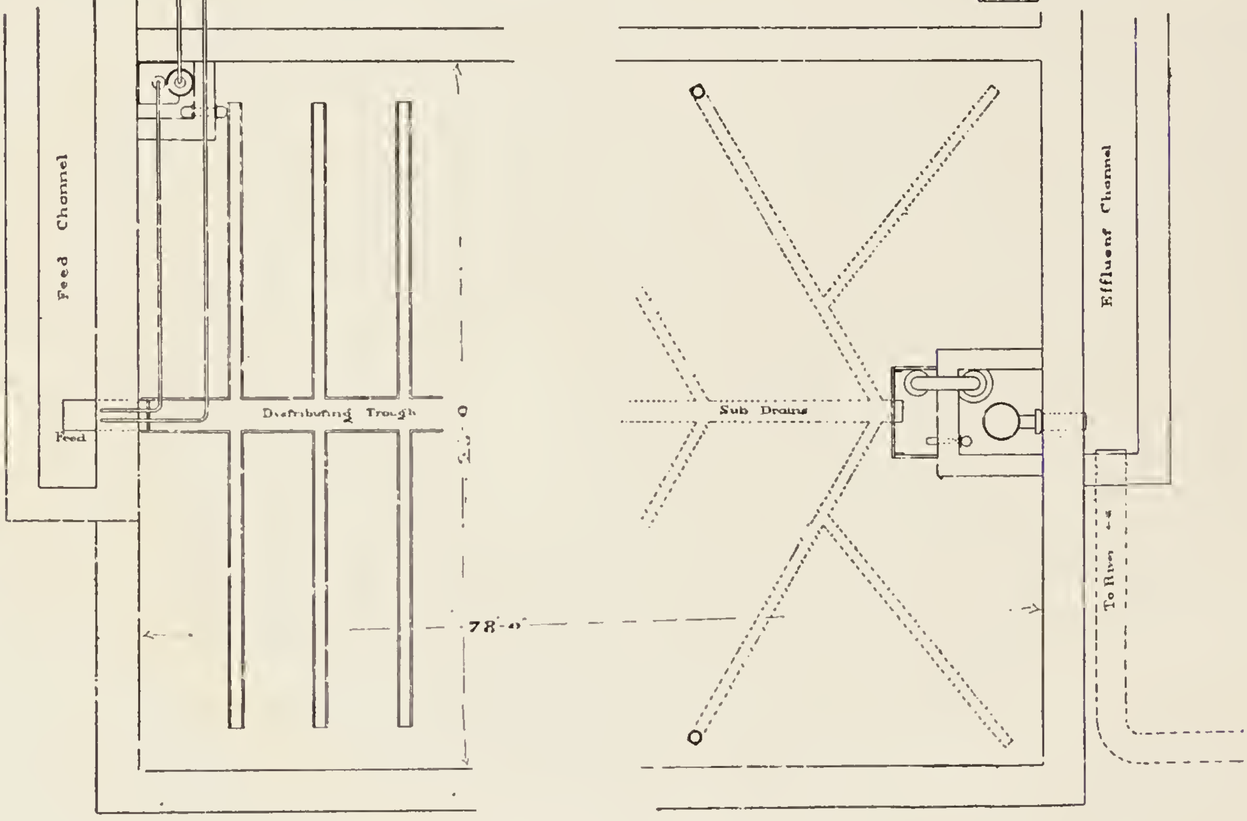
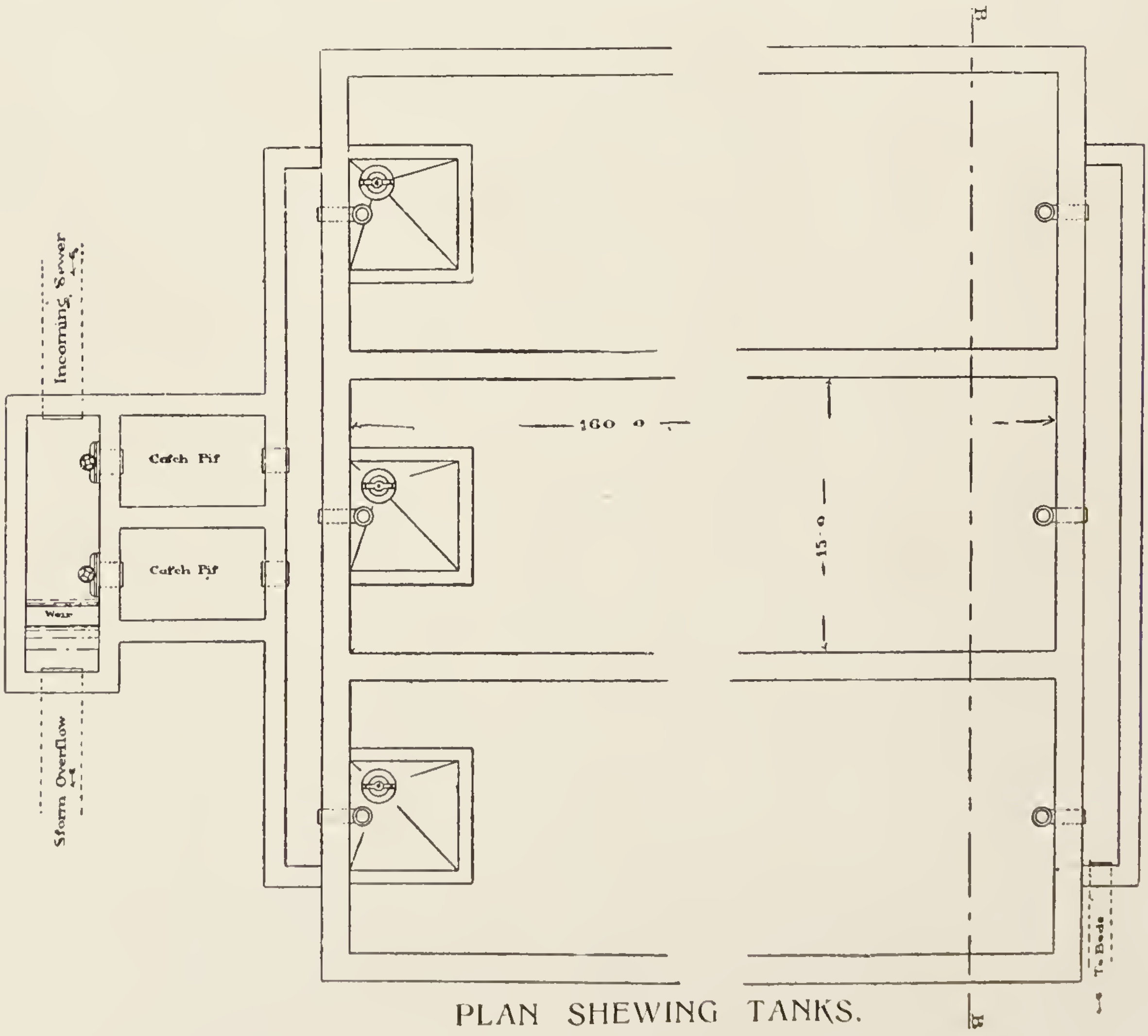


PLAN SHEWING ONE BED.



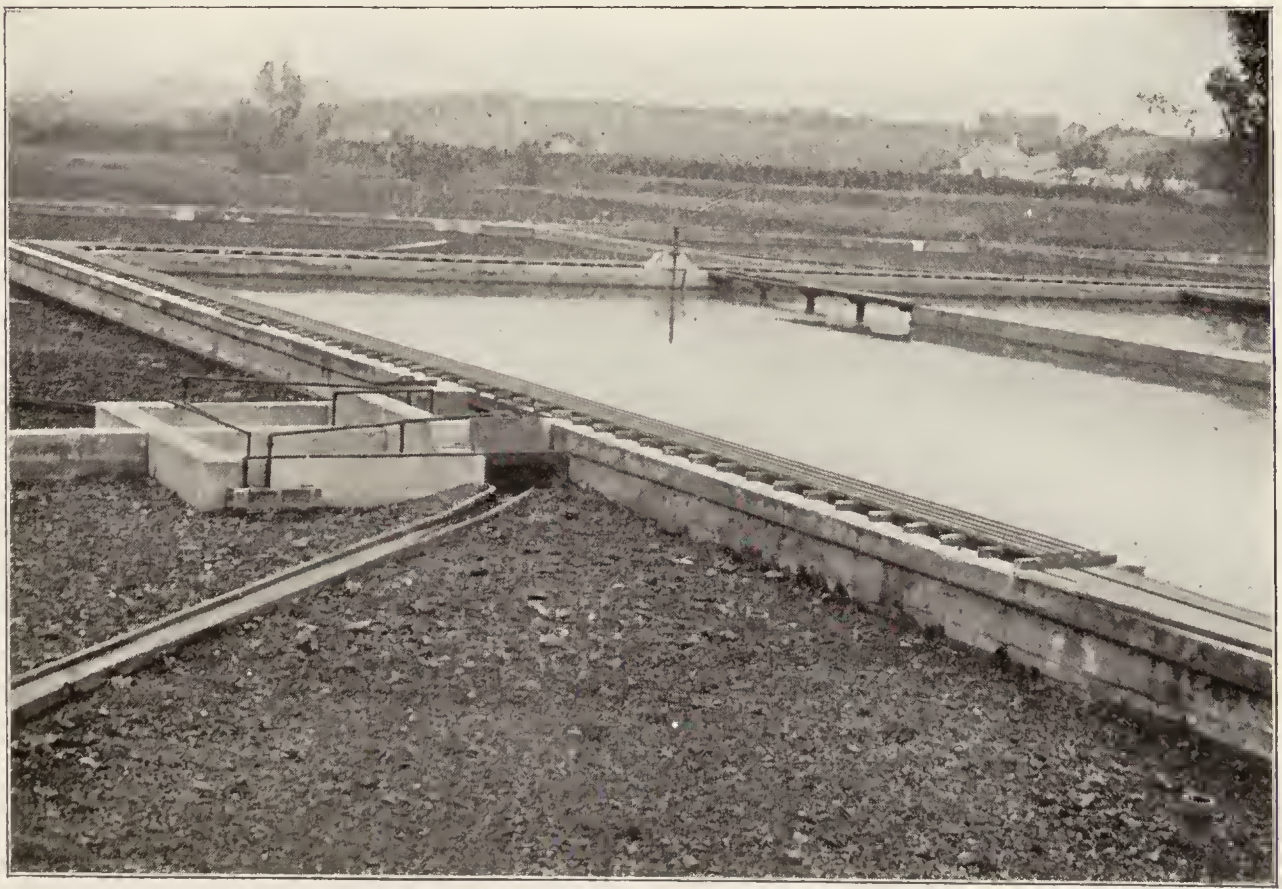
PLAN SHEWING TANKS.

Sewage Disposal, etc.

Bacteria Beds, Curragh Camp, for War Office.

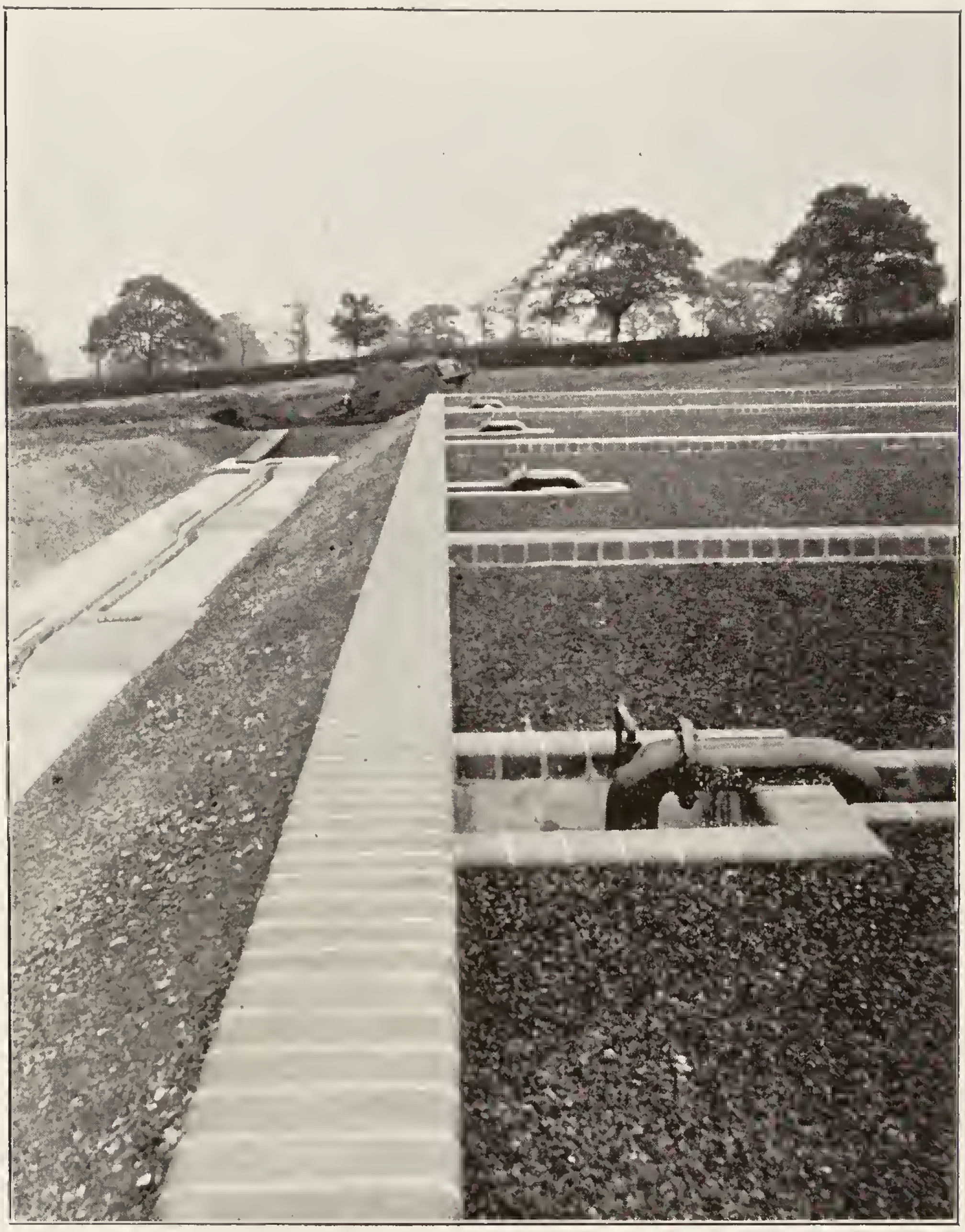
THE drawings shew the Automatic Feed and Timed Discharge Syphons as embodied in an average installation. In this instance single contact only is provided for. The sewer discharges first to an intercepting chamber having a storm overflow weir, and thence by one or other of two catch pits to the scum tanks, and the beds (of the latter a part of one only is shewn). The feeds discharge to an open distributing trough. Dotted lines indicate the ventilated sub-drains, which terminate in the well, from which the timed discharge syphon draws its supply.

The photograph below shews these works as completed.



Bacteria Beds, Armagh

Sewage Disposal, etc.



Timed Syphons discharging Secondary Beds to Outfall.
3rd Installation at Ealing—CHAS. JONES, Esq., Engineer

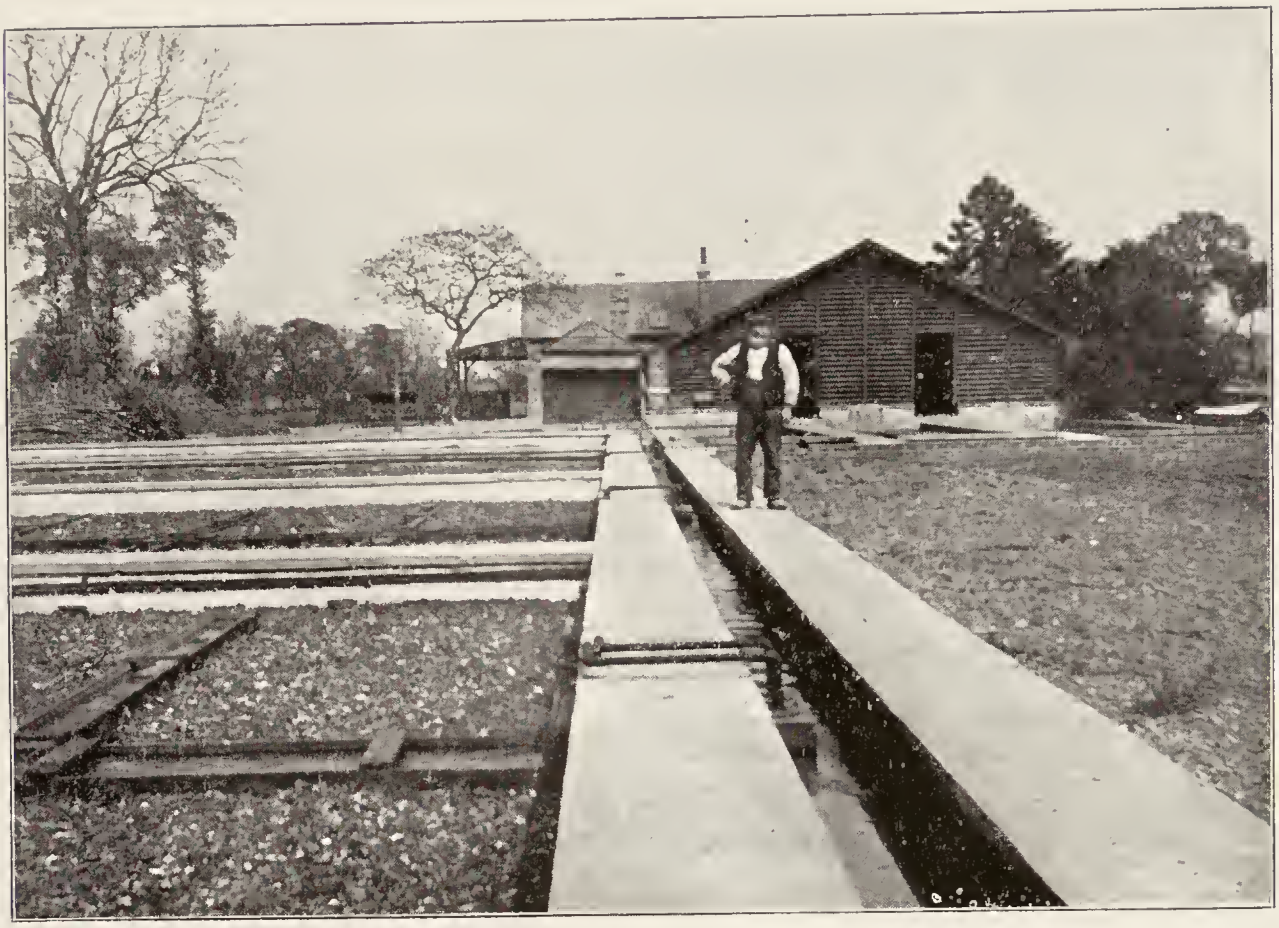
THE drawing upon page 37 shews very clearly the action of the timed Discharged Syphons. The Syphon proper is placed in a chamber adjoining the bed—it has an over-draw pipe dipping into the bed. A tap delivers liquid from the bed to the Syphon chamber, the latter fills in the desired time and brings the Syphon into work, when the contents of the bed will be discharged to the outfall through the Syphon over-draw pipe.

This apparatus is equally valuable for use in the smallest or the largest schemes—whether in purifying the sewage of a single house, etc., or for operating such extensive installations as that at Croydon, Leicester, etc.

C. J. MARPLES, Esq., J.P., Thornbridge Hall :—

> "The Bacteria Beds you put down for me here as Single Contact Beds have been altered to your new system of Multiple Contact, and are giving, without any increased area, an effluent about equal to triple contact. The effluent is clear and bright and almost fit, I am told, to drink, though I should not care to do it."

Sewage Disposal, etc.



View shewing Syphonic Feeds.

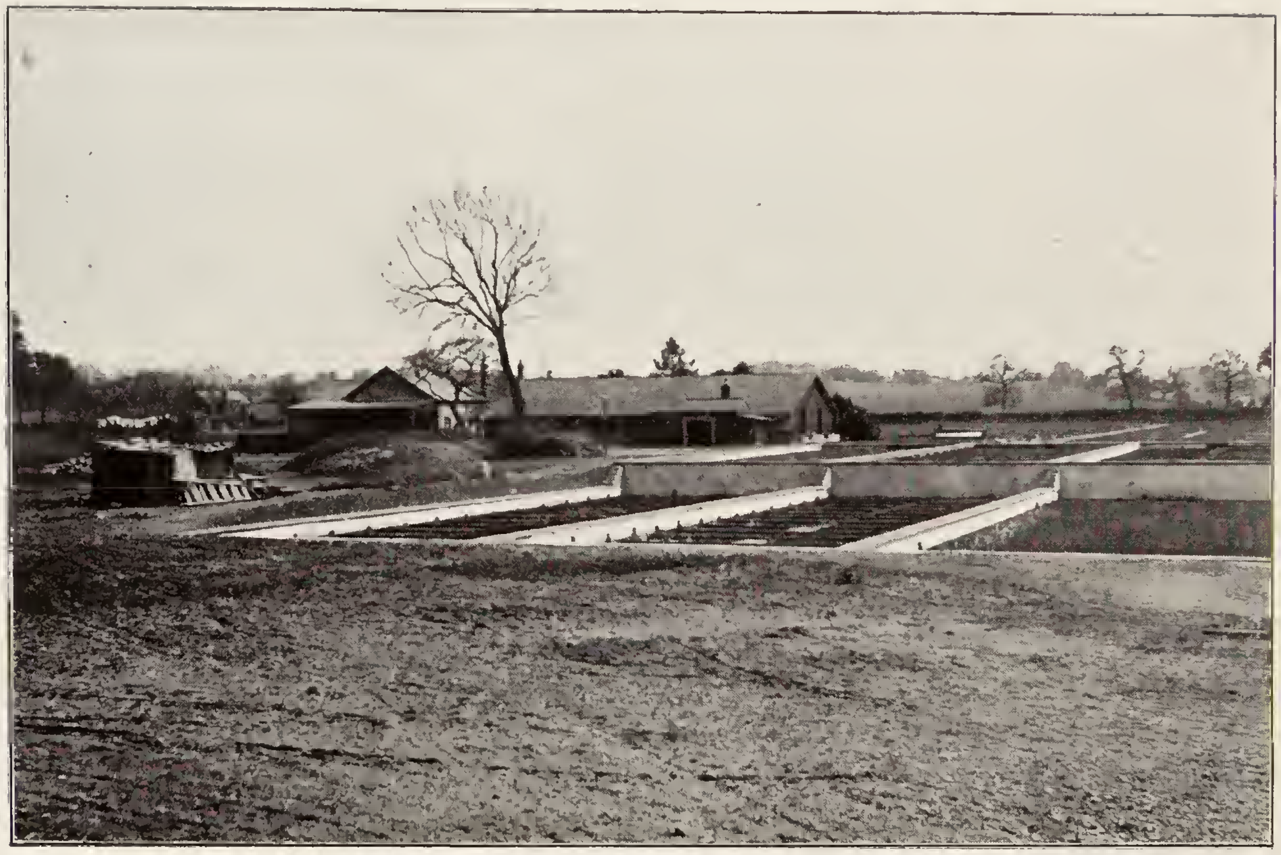
THE Syphonic Feeds are described at page 34. They are in effect Syphon Traps—open to the passage of liquid until such time as an air-lock is formed within (by the transfer of air from a dome placed within the bacteria bed). The allowed escape of air and consequent bringing on of the supply, follows the filling of the prior bed. By means of bye-passes any bed can be cut out of work or operated in any desired rotation. The supply channel common to the primary beds is seen at right hand of picture—the Feeds are fitted within this channel—they discharge in rotation to their respective beds. When the sewage has stood within the latter for the proper time of contact, it is discharged to the secondary beds—through the Timed Syphons shewn on the preceding page.

C. CHAMBERS SMITH, Esq., Surveyor U.D.C., Sutton, Surrey :—

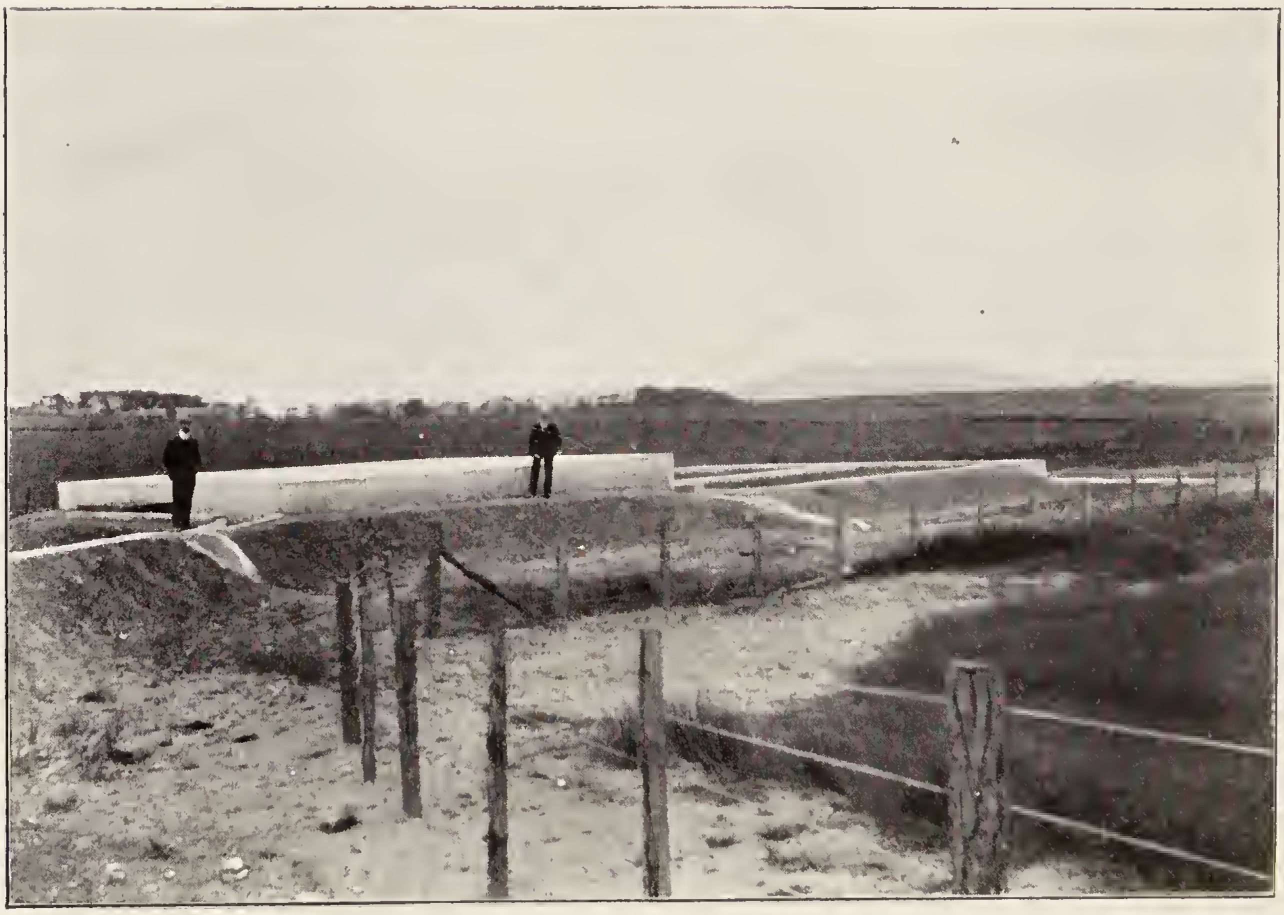
> "I have had your Patent Syphonic Apparatus for charging and discharging our Bacteria Beds here for the past 18 months, and have found it to work in a thoroughly satisfactory manner. Continual efficiency in the purification of sewage may, by the use of the apparatus, be relied upon."

E. R. CAPON, Esq., Surveyor U.D.C., Epsom :—

> "It has worked most satisfactorily without interruption. Previously I had to arrange for a man to attend these beds every two hours. Since the apparatus has been working the services of this man have been dispensed with."

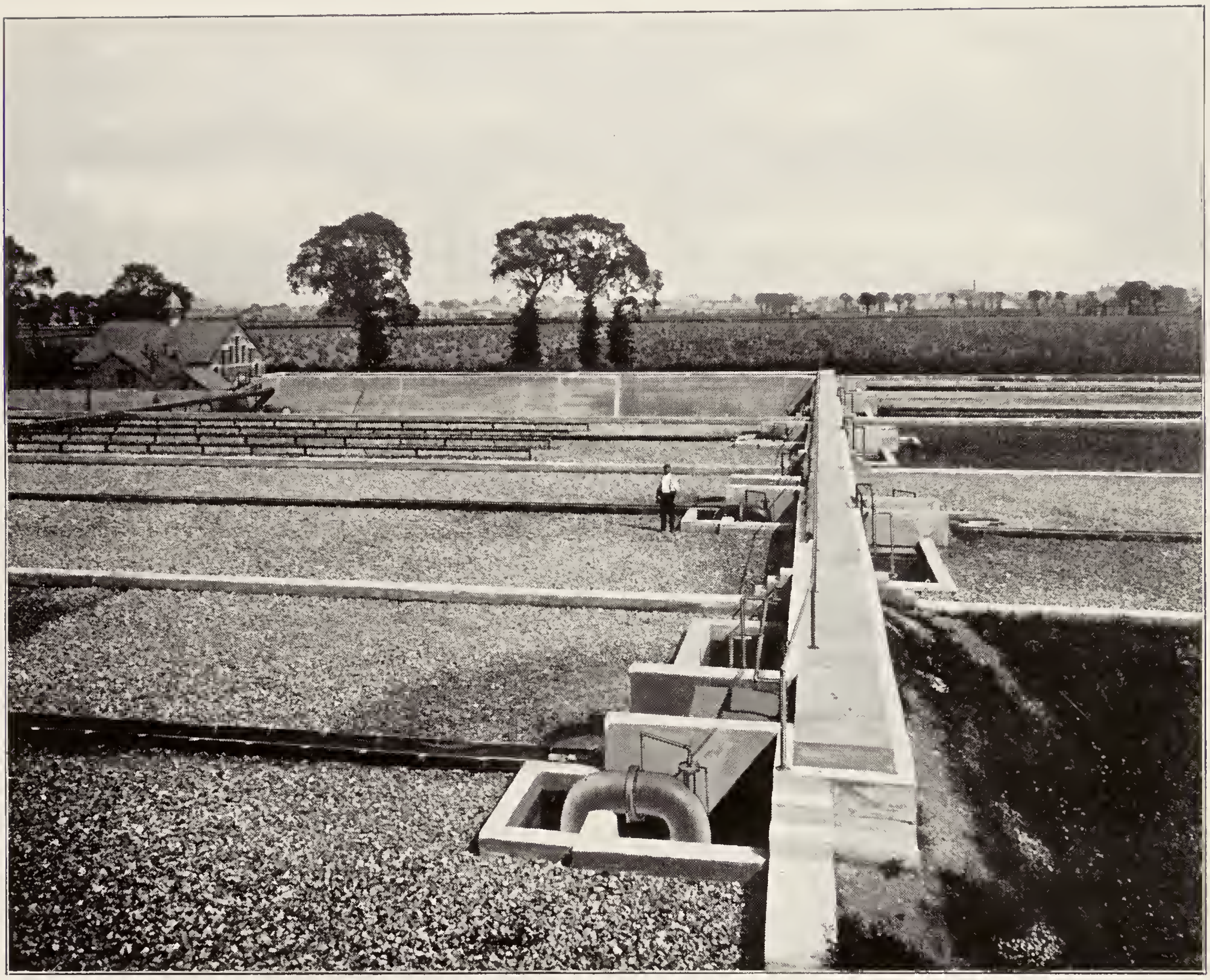


The Third Installation at Ealing, installed for CHAS. JONES, Esq., M.I.C.E., Engineer to the Council.



Double Contact Beds, Old Meldrum.
Messrs. JENKINS & MARR, Civil Engineers, Aberdeen.

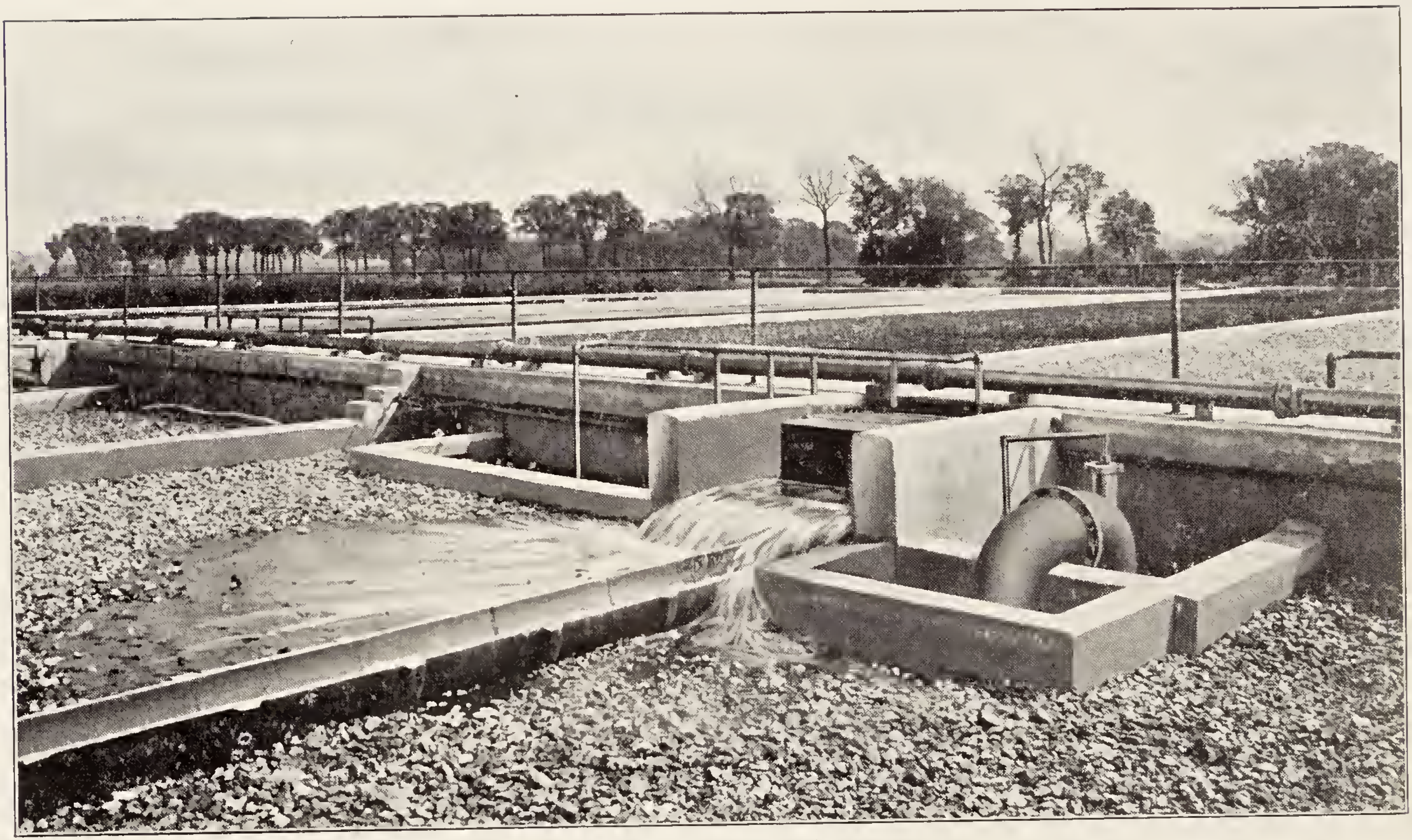
Sewage Disposal, etc.



Croydon Bacteria Beds.

THE view above—looking along the centre of the beds—shews the covered supply channel, in which the Feeds are placed, with effluent channel below. As will be seen the beds are on either side of this channel. The apparatus is capable of dealing with more than two million gallons of sewage per day.

Sewage Disposal, etc.

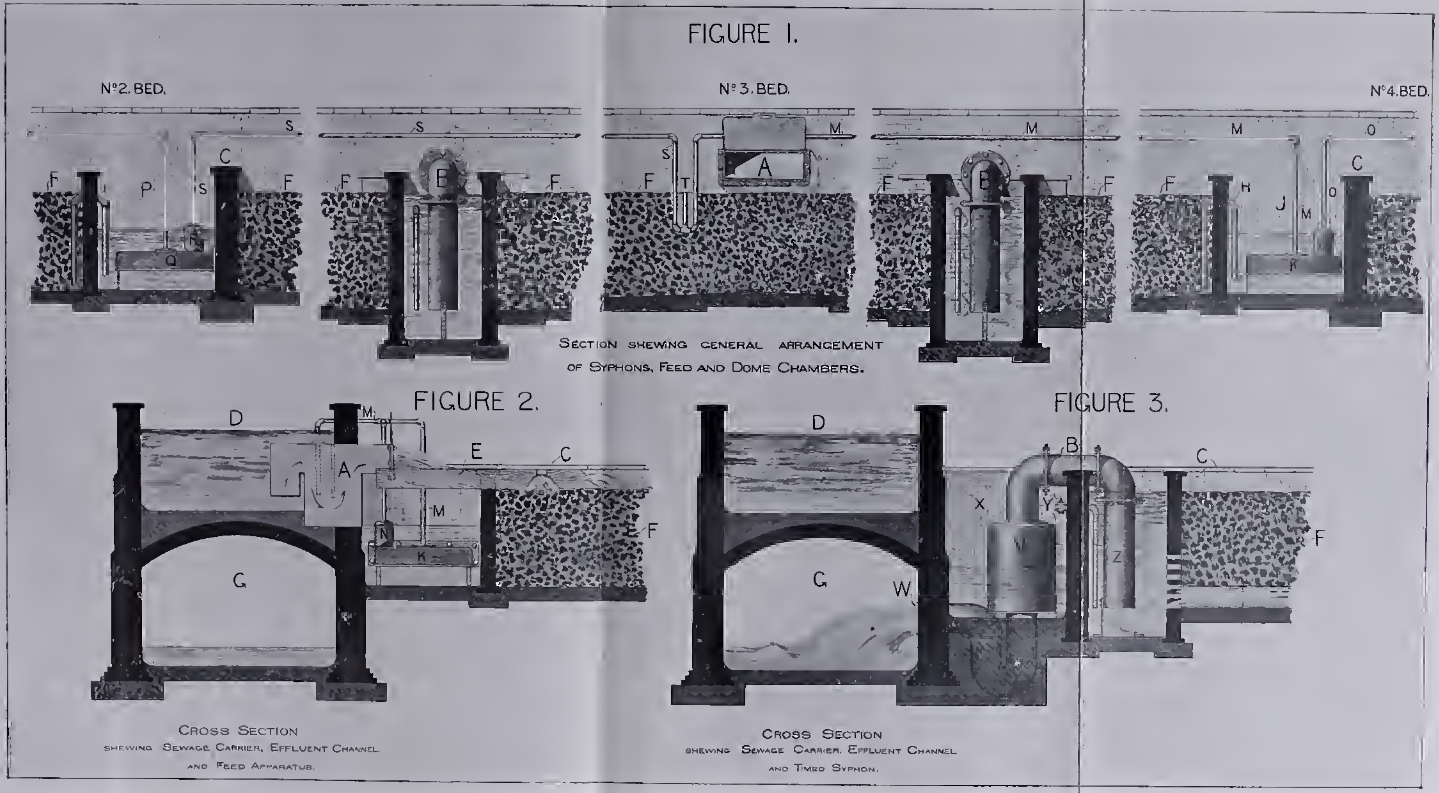


Croydon Bacteria Beds.

THIS view of the Croydon Bacteria Beds (JOHN WALKER, Esq., M.I.C.E., Engineer), shews one of the large Inlet Feeds discharging sewage from the supply channel to one of the beds. At the left is the chamber for stop-off dome (the latter contains 40 cubic feet of air). This is transferred automatically to the feed to shut off the supply and to open that of the feed next in rotation. One of the withdrawing syphons (by means of which the beds are emptied) is shewn at the right.

☞ The Cresset Revolving Distributors are shewn elsewhere.

Sewage Disposal.



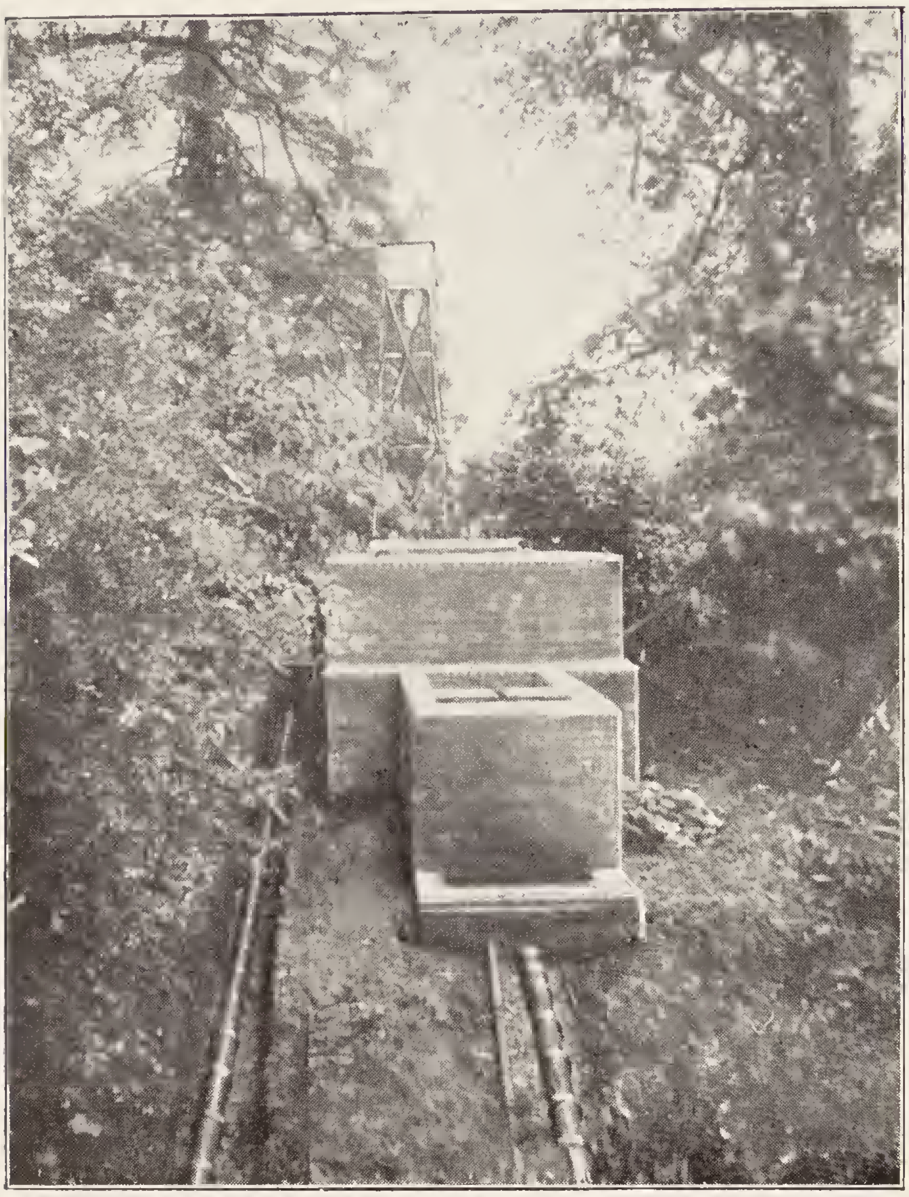
SECTION SHEWING GENERAL ARRANGEMENT OF SYPHONS, FEED AND DOME CHAMBERS.

CROSS SECTION SHEWING SEWAGE CARRIER, EFFLUENT CHANNEL AND FEED APPARATUS.

CROSS SECTION SHEWING SEWAGE CARRIER, EFFLUENT CHANNEL AND TIMED SYPHON.

Drawing shewing Adams' Patent Timed Syphons and Air Controlled Feed Apparatus.

Sewage Disposal, etc.



Sewage Automatically raised to Bacteria Beds.

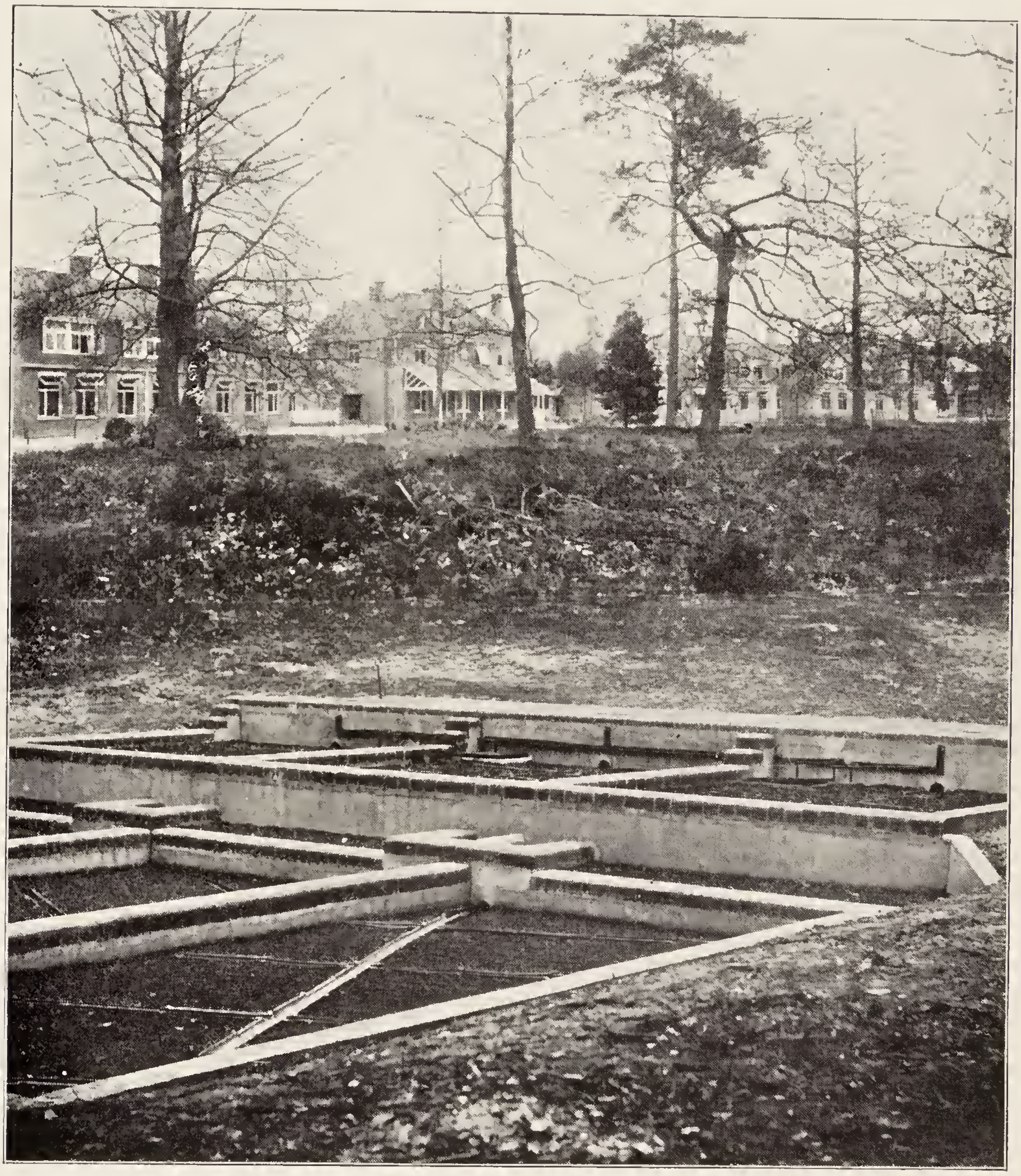
TWO PRIMARY AND ONE SECONDARY BED, WITH SEWAGE LIFT.

THE Installation shewn consists of a scum tank, two primary beds, and one secondary bed. The distribution from bed to bed is brought about by the automatic feeds and timed syphons. The works are constructed entirely above ground, no fall being available, and the sewage is raised by an Automatic Sewage Lift to the beds. The lifting and the purification are both thus automatically provided for. The Lift requires no attention, and the beds the slightest oversight only. The erection upon which the Lift is placed, in this instance, is seen in the background—the storm overflow pipe on the left, and the effluent pipe (discharging to an ornamental lake) in the foreground.

For description of Sewage Lift, see prior pages.

Sewage Disposal, etc.

Bacterial Installations are specially fitted for the treatment of Sewage derived from Public Institutions, such as Asylums, Hospitals, Sanatoria, etc.



W. FAIRLEY, Esq., Civil Engineer Richmond Main Drainage Board.

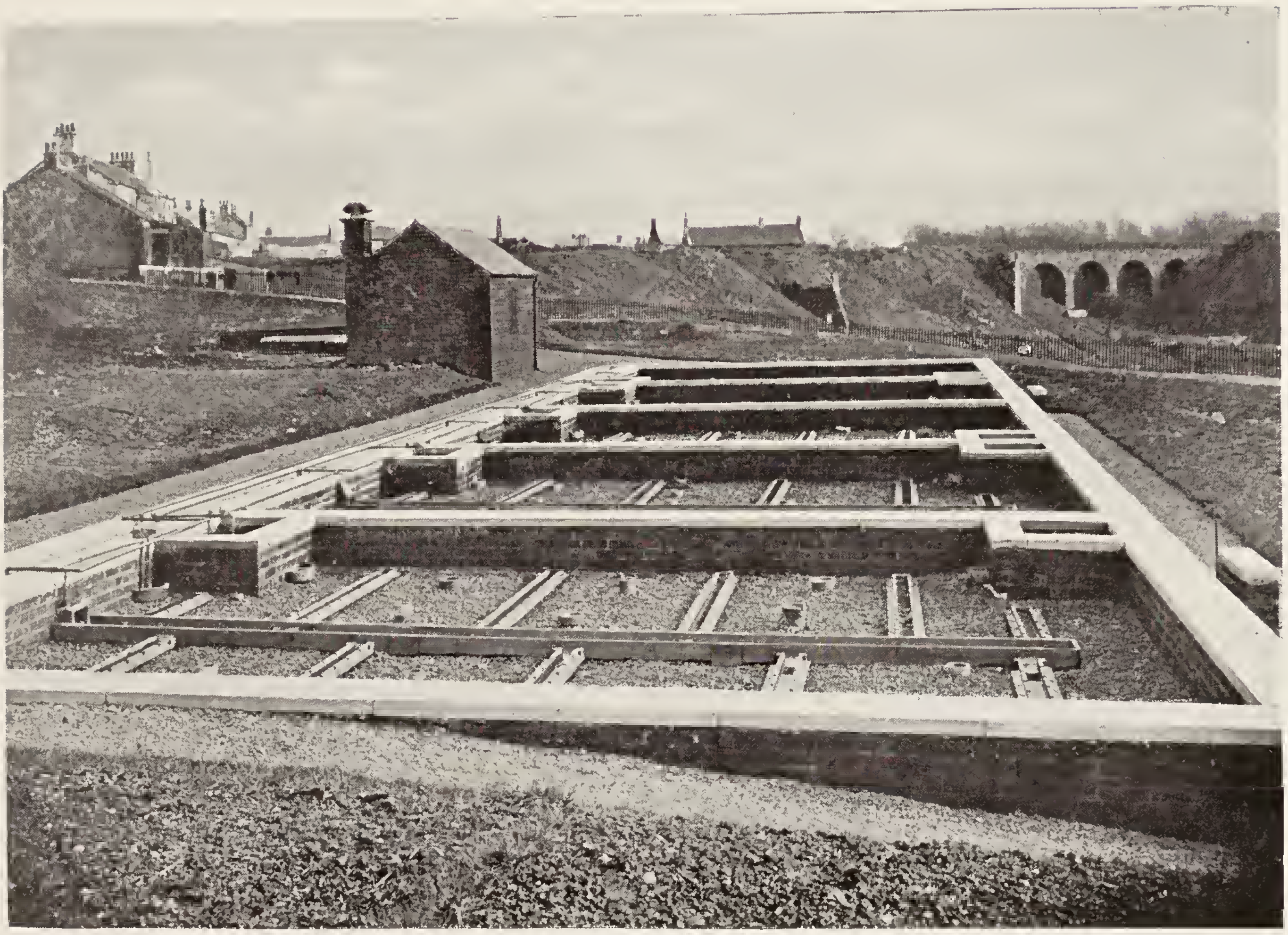
THIS view shews an installation laid down at the Sanatorium, Pinewood, Surrey. The sewage is treated upon primary and secondary beds; it is delivered to the former from a dosing tank in rotation, by means of syphonic feeds.

URBAN SMITH, Esq., Civil Engineer, Westminster:—

> "Have nothing but good to say in reference to your Syphons. I used to regard them as somewhat expensive, but having tried cheaper patterns have come back to yours, which have always worked."

Sewage Disposal, etc.

Sewage Purification Works.—Cleland and Omoa.



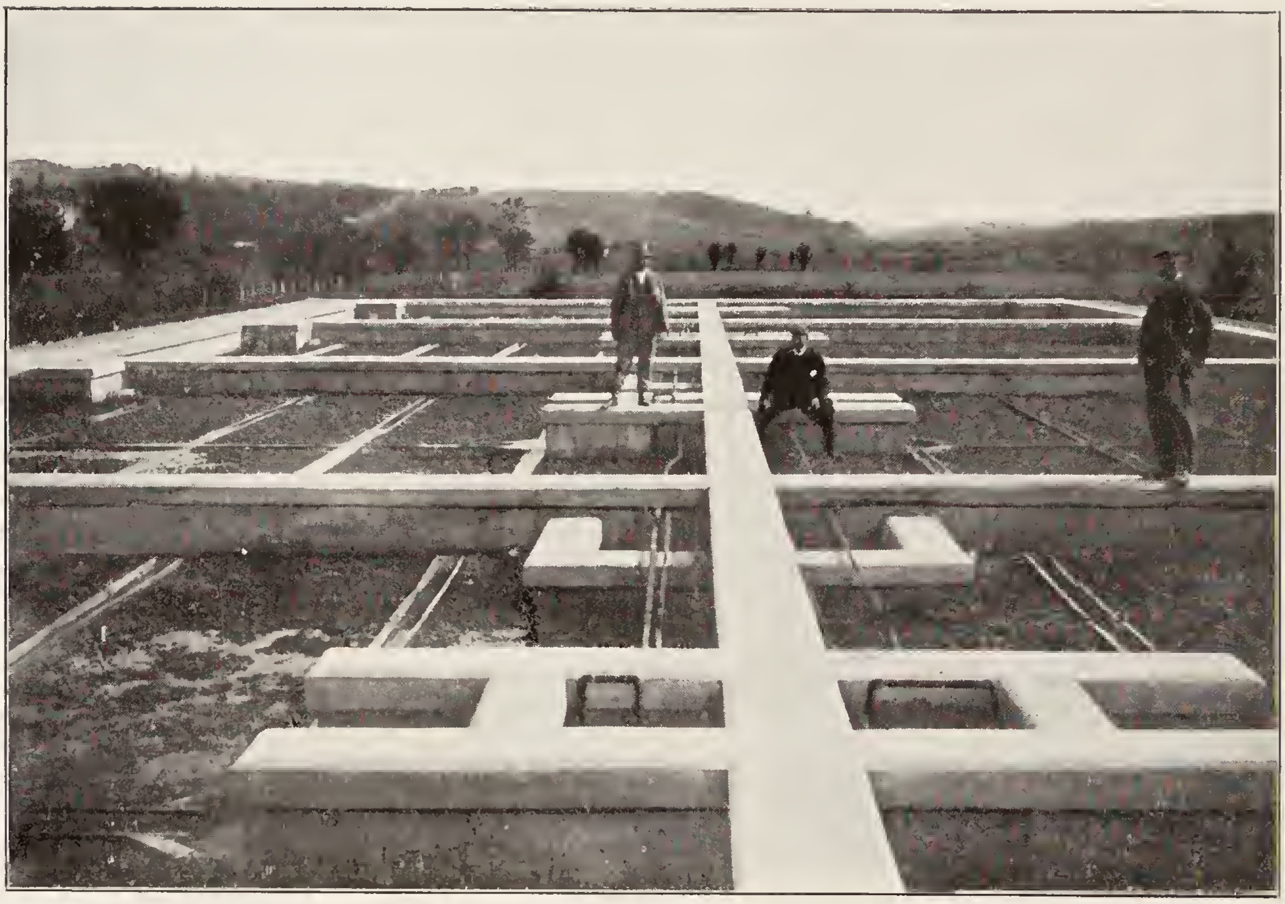
W. L. DOUGLASS, Esq., Civil Engineer, Hamilton.

THE above installation consists of five single contact beds. The supply channel and automatic feeds are shewn on the left hand, and the discharge syphon chambers on the right.

Messrs. HEATON, RALPH & HEATON, Civil Engineers, Wigan:—

"The Syphons you have fixed at the discharging ends of the filter beds for the Abram Urban District Council entirely empty the beds, and the entire automatic installation you have provided for filling and discharging the eighteen beds is working most satisfactory."

Sewage Disposal, etc.



Single Contact Beds at Moffat.—Messrs. NIVEN & HADDEN, C.E., GLASGOW.

HERE there are eight beds—four on each side of the central supply channel, in which the feeds are placed. The syphon chambers are seen at the left and right hand. The beds receive and discharge their contents one after another, the cycle being repeated indefinitely.

No moving part is employed.

After 12 years one of our 30 in. diameter Sewer Flushing Syphons is still in work. A. G. McBEATH, Esq., Sale, says:—

> "It has given me every satisfaction and works to-day in the same efficient manner as when first started."

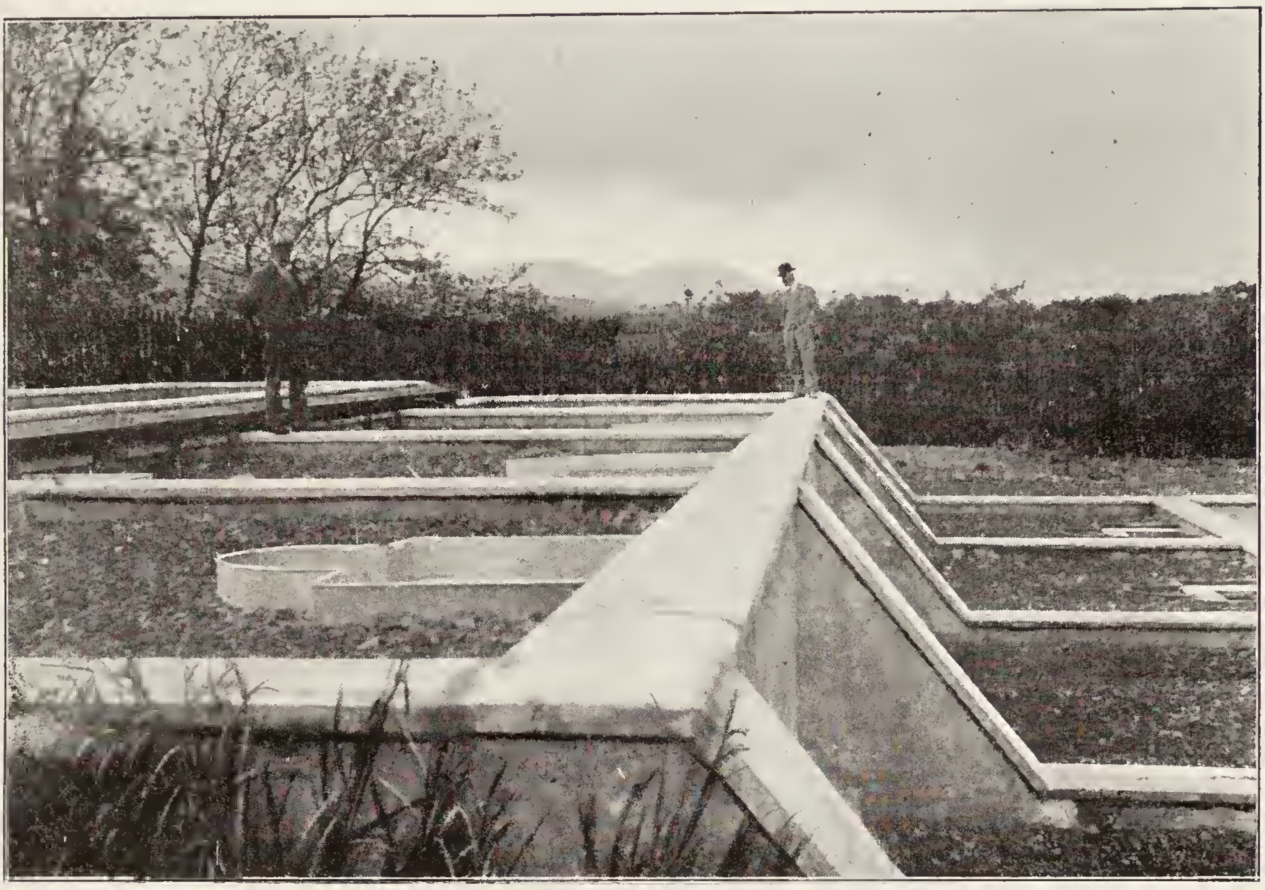
Messrs. DIBDIN & THUDICHUM, Consulting Chemists, Westminster:—

> "We have been largely associated with you in the introduction of the Automatic Syphons for Bacteria Beds which have been fitted by you in a number of cases, in which we are interested, and in every instance they have given the most unqualified satisfaction."

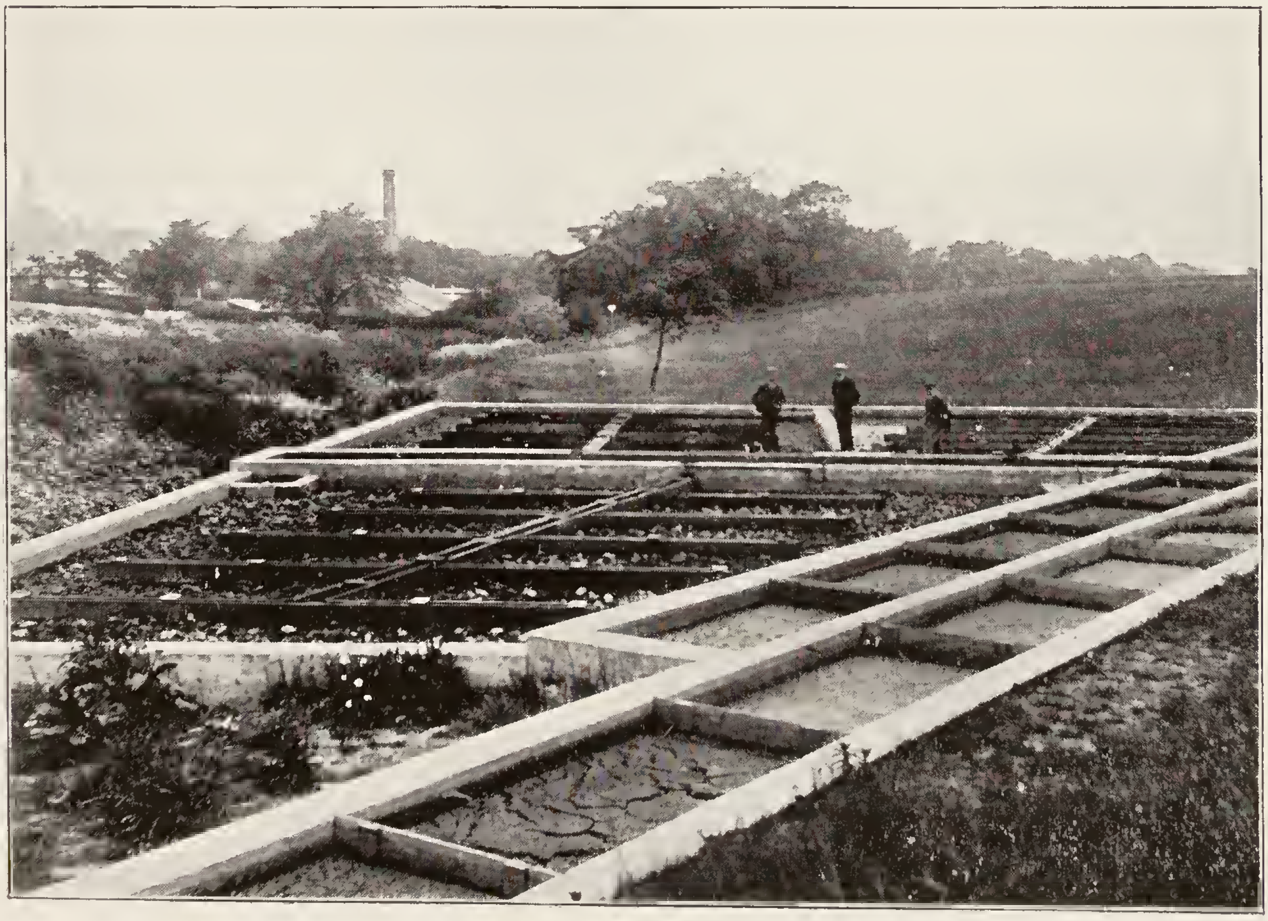
NOTE.—See page 61 for the New Multiple Contact System.

Sewage Disposal, etc.

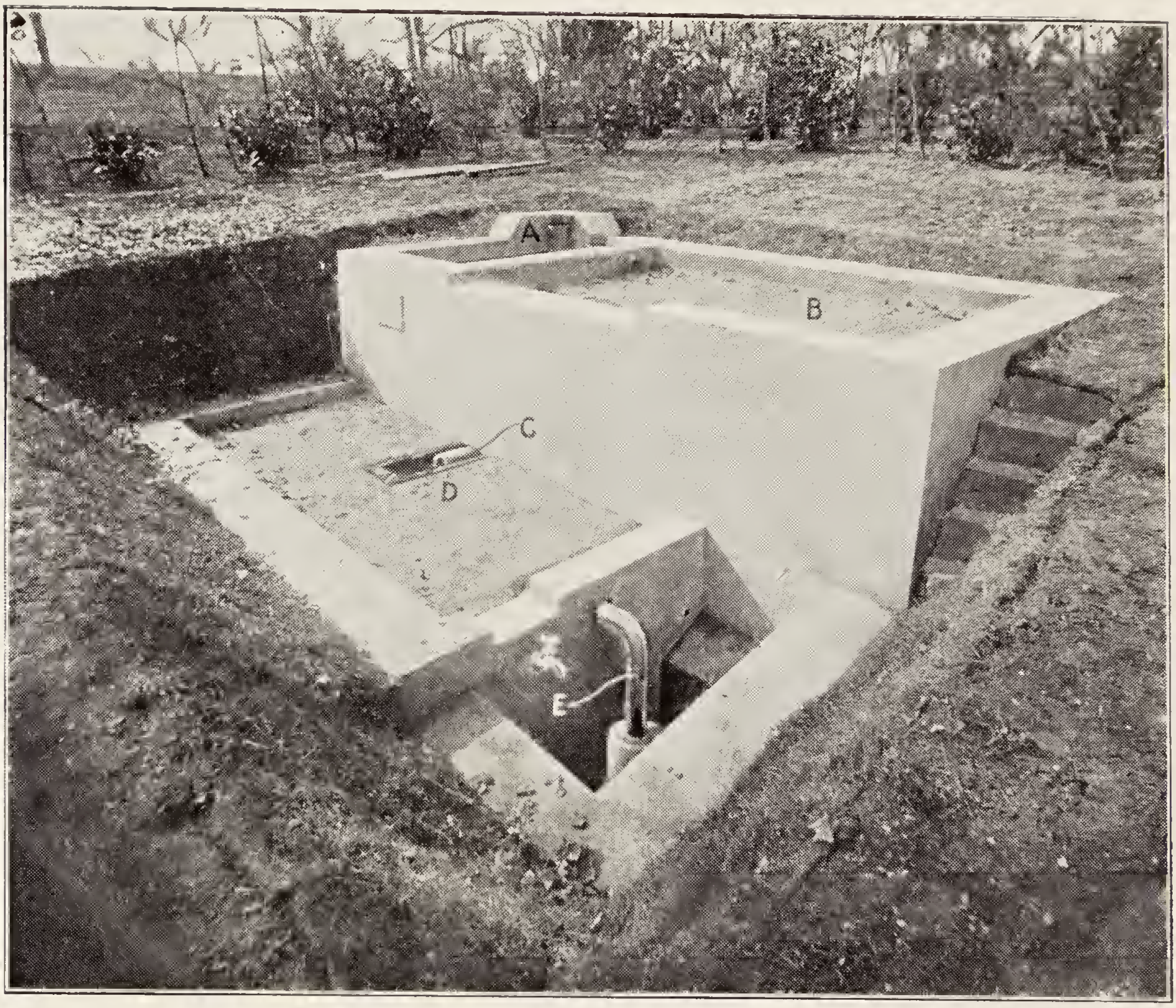
THIS view shews very clearly the general arrangement of a small town's installation. The scum tank is seen at left hand side, it overflows to a channel running along the length of the primary beds; in this channel the air-lock feeds are placed. By means of these feeds the primary beds are filled in rotation; they discharge direct to the secondary beds at the lower level, through timed syphons. The liquid from the lower level beds is discharged in the same manner to the outfall.



THE next view (of the Penicuik Beds) shews a single contact installation operated by feeds and syphons. The scum tank is formed as a long channel and is furnished in this instance with baffle plates to prevent movement of scum.



Sewage Disposal, etc.



Small Domestic Installation.

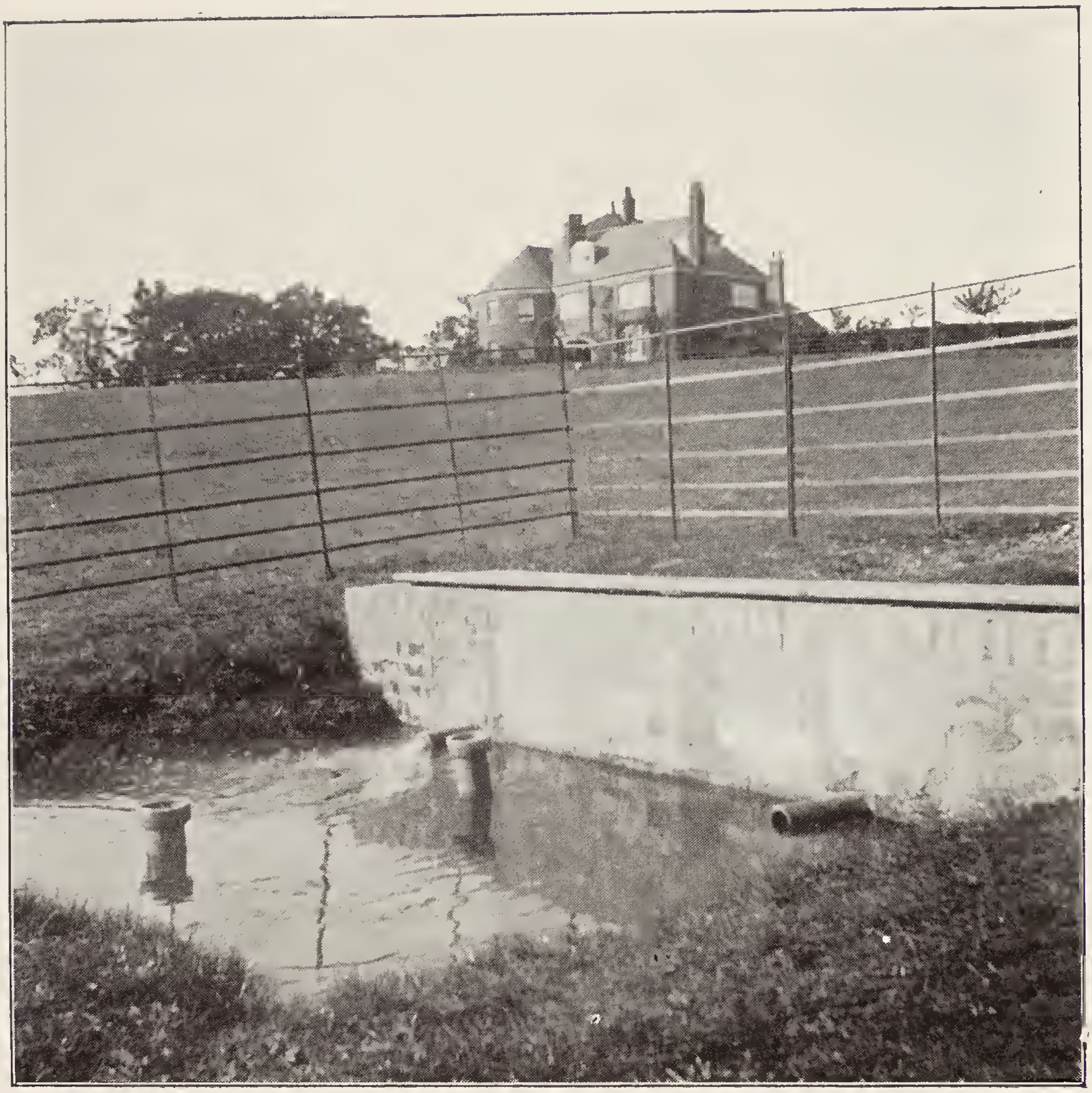
ONE PRIMARY AND ONE SECONDARY BED.

THE disposal of sewage from country houses, hospitals, etc., is rendered easy where bacterial methods are adopted. No chemicals are required, and where automatically operated, little attention is required. At the same time the effluent is ordinarily sufficiently pure to be turned into any stream or pond, etc.

In the installation shewn above, sewage first enters the tank, 'A,' passing from thence to the primary bed 'B.' From this it is discharged, when full, automatically by means of a syphon—its outgo is seen at 'C'—to the secondary bed 'D,' upon which it is retained for further bacterial contact, being finally discharged, after the expiration of the necessary period, by the timed syphon, 'E.' The discharge of the syphon depends upon the rate at which the small chamber 'F' is filled. This rate may be determined by means of the stop cock shown. The period which is found to give the best effluent having been obtained by experiment, no further adjustment is required. The beds will fill and discharge automatically, the work of purification going on with an occasional inspection only.

The apparatus brings about, in the simplest manner, and wholly without moving parts, the periods of saturation and aeration. Irregular or excessive contact (difficult to avoid without the use of automatic apparatus), means ordinarily, the conversion of a good effluent to one which is dangerously impure.

Sewage Disposal, etc.



At a Country House.

THE above view represents an extremely simple installation laid down for a country house. The Sewage passes direct from a covered cesspool to a syphon chamber, from which it is discharged automatically alternately to one or other of the beds.

The owner says:—

> "I have much pleasure in expressing my entire satisfaction with the result; the automatic apparatus goes off with perfect regularity, and the astonishing effect of the filtration requires to be seen to be believed. The effluent is as clear as drinking water."

NOTE.—See later pages for Self-contained Bacteria for Country Houses, etc.

Sewage Disposal, etc.

Beds at Cheveley Park, for the late Col. McCALMONT, M.P.

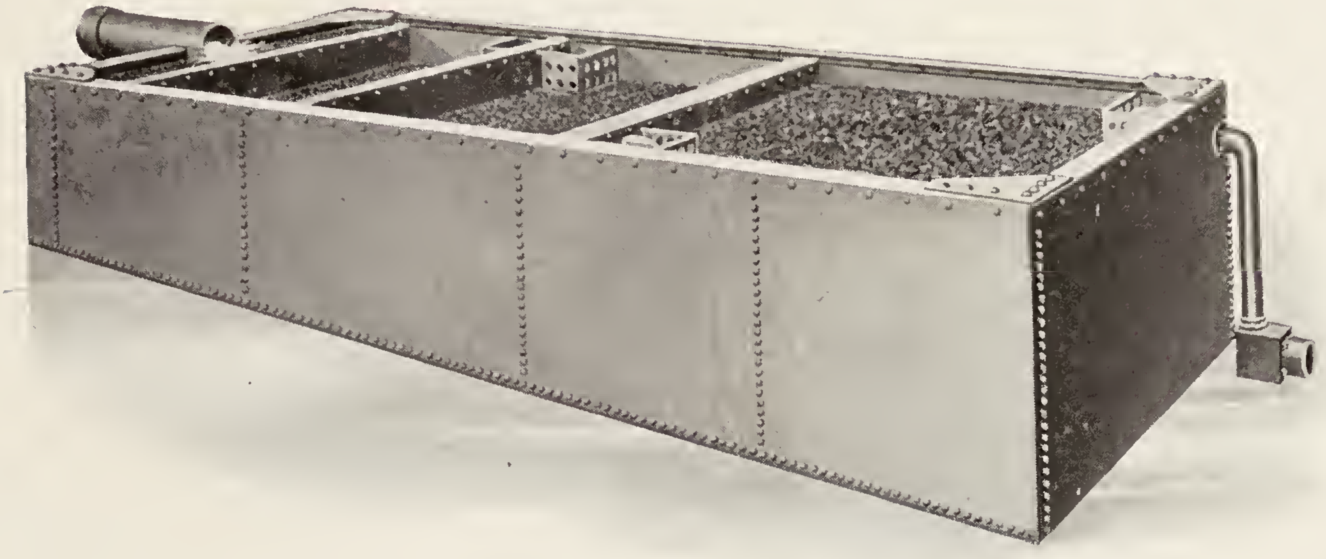
THE effluent obtained from the above beds is practically pure water. The sewage first enters a scum tank, from thence it passes to a syphon dosing tank which floods the primary bed. From the latter the liquid passes to a secondary bed, and thence to a final sand filter.

HERBERT J. GARROD, Esq., C.E., Newmarket, says of them:—"I am glad to say that the Automatic Apparatus at Cheveley Park Bacteria Beds is working in a satisfactory manner and a good effluent is obtained."

S. J. L. VINCENT, Esq., Borough Surveyor, Newbury, says of our Patent Disc Valves:—"The best I have ever seen."

Sewage Disposal, etc.

SELF-CONTAINED SET FOR COUNTRY HOUSES, etc.



Adams' Patent Self-contained Bacterial Tank Filter for Country Houses, etc.

THIS apparatus is sent out complete ready for fixing, requiring only to be filled with the coke or clinker or other filtering medium.

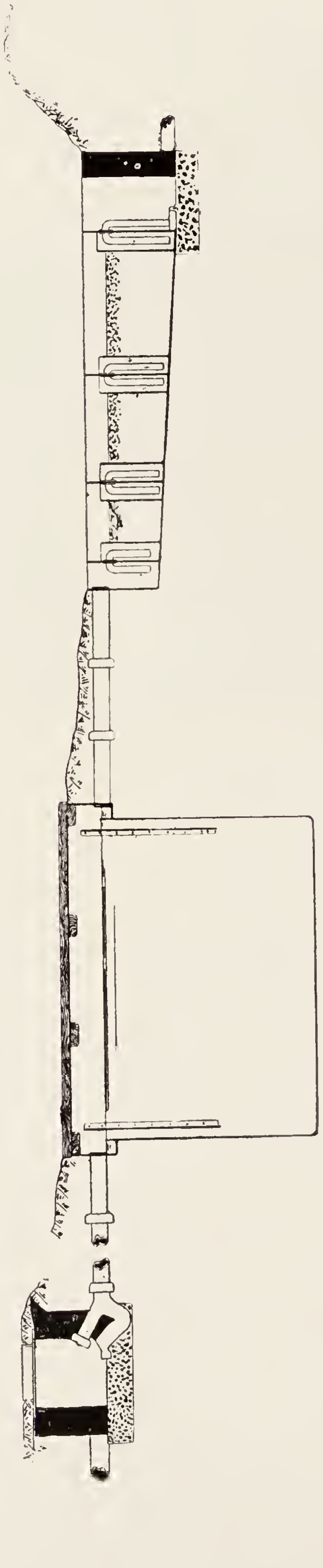
The Filter receives the overflow liquid from a cesspool or Septic Tank, delivering it after treatment to any desired outfall. The effluent produced is sufficiently pure to discharge to an ordinary water course. The filter is similar in design and operation to that shewn on page 55, being an adaptation of Adams' Patent Multiple Contact System. The iron tank is sub-divided, and is fitted with the necessary syphons, etc.

☛ Particulars of Domestic Trickling and Spray Filters, etc., upon application.

Sewage Disposal, etc.

SELF-CONTAINED SET FOR COUNTRY HOUSES, etc.

ADAMS' PATENT MULTIPLE CONTACT SELF-CONTAINED
TANK AND FILTERS.



Installations suitable for Country Houses, Institutions, etc.

SEWAGE from house enters disconnecting chamber, passes through liquefaction tank, overflows, and thus to filters, and finally to land or stream, etc.

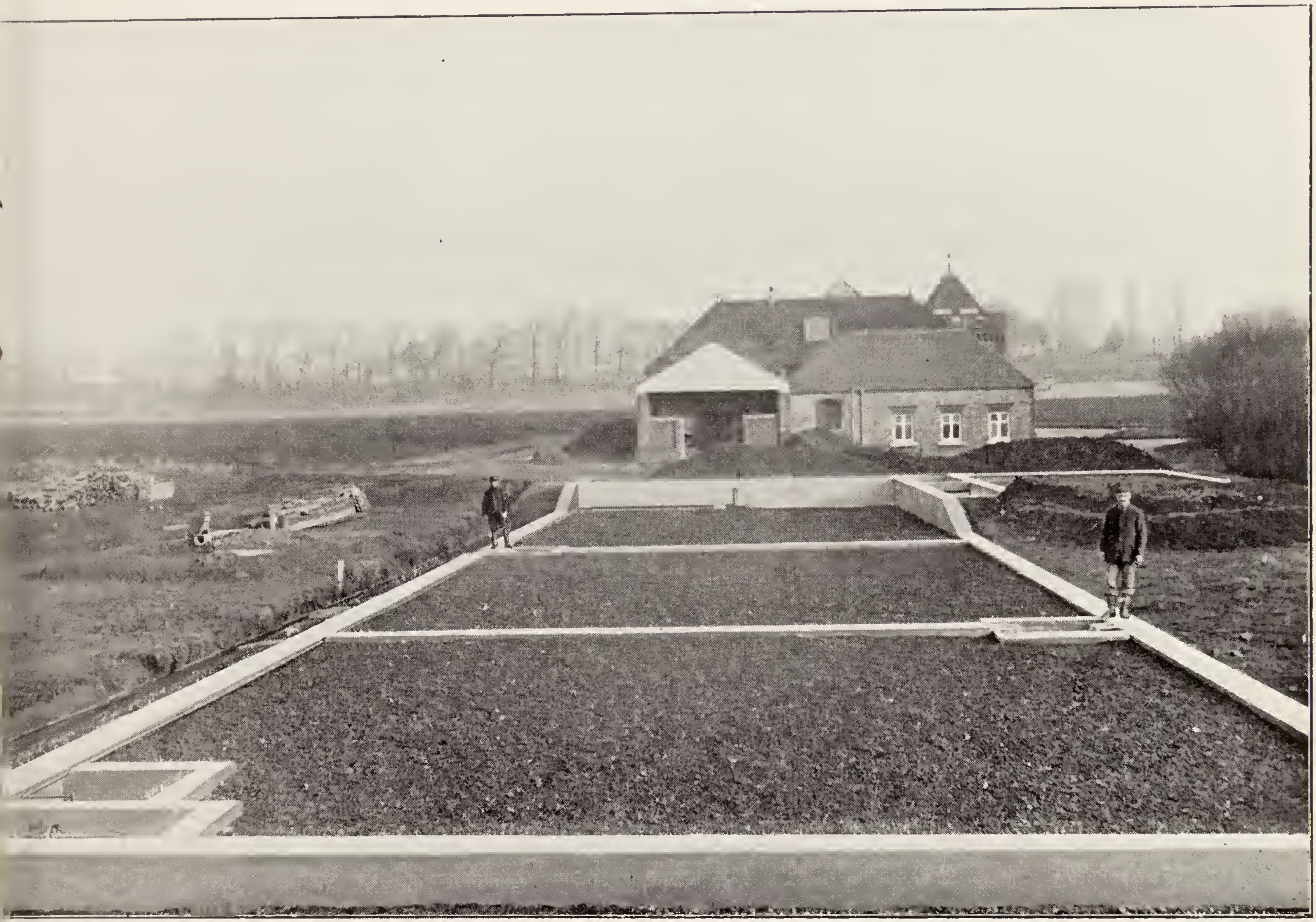
For description see previous page.

Sewage Disposal, etc.

(PUMPING ABANDONED.)

ADAMS' PATENT STREAMING MULTIPLE CONTACT SYSTEM FOR SHALLOW BEDS.

Contact and Lateral Filtration.



Purification Works at Sutton, Surrey, for C. CHAMBERS SMITH, Esq., Engineer.

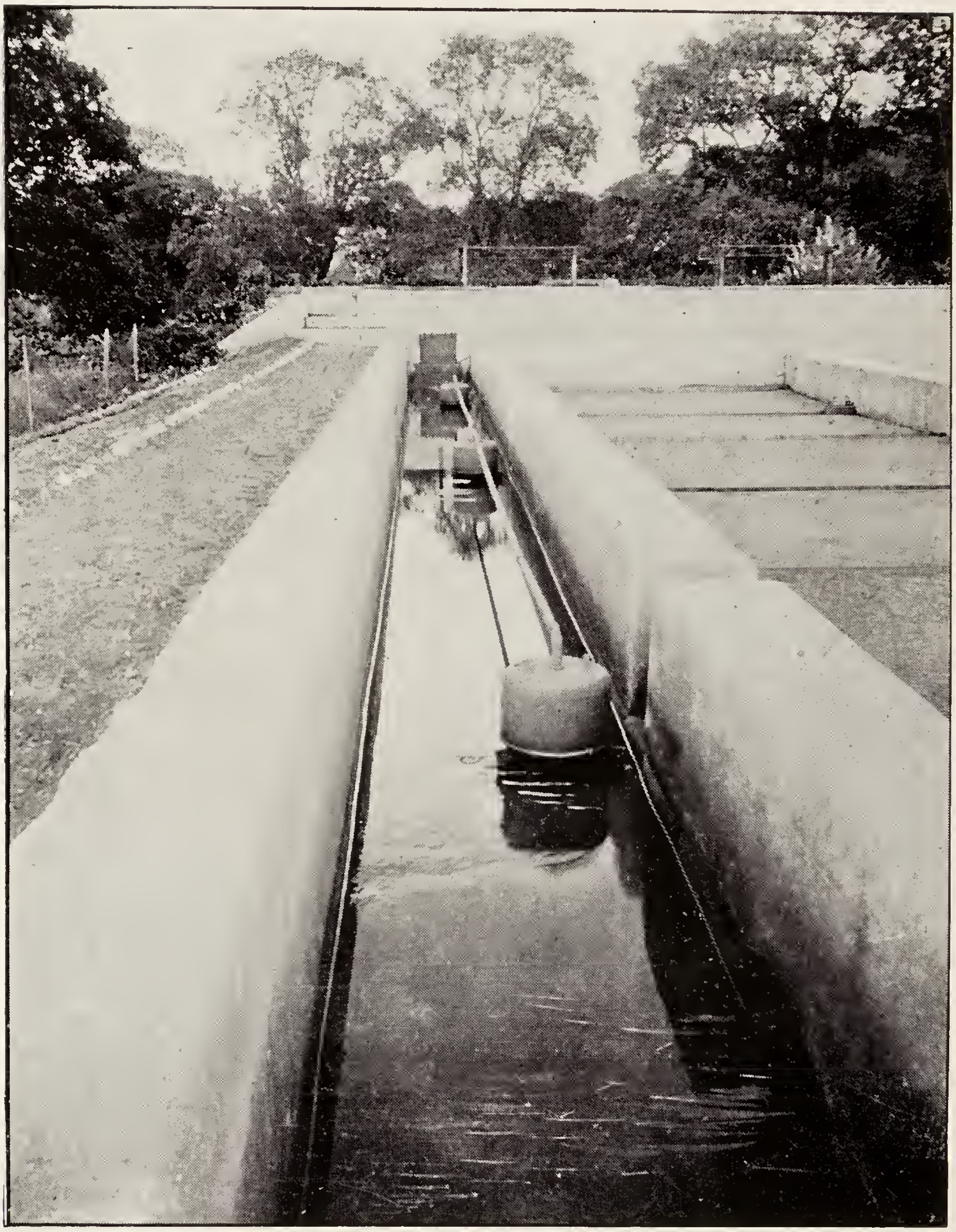
At Sutton the bulk of the sewage flows by gravity to the High Level Double Contact Beds. It was necessary to pump the low level sewage to the same height for similar treatment. To obviate the cost of pumping our Patent System for shallow depths has been adopted. The first of the series of six similar beds is shewn above. When the installation is complete, PUMPING WILL BE ABANDONED. The sewage, after its passage through sedimentation tanks, is (temporarily) collected in a shallow storage tank, from which it is discharged to the first filter; this discharges to the second, and the second to the third, and finally this to the outfall. The lateral travel of the sewage from bed to bed is a very important factor in its purification. Any number of beds may be operated upon this system.

NOTE.—See page 54a, etc., for Self-contained Bacterial Filters for Country Houses, Institutions, etc.

☛ See page 62 for full details of system.

Sewage Disposal, etc.

DOSING FILTERS.

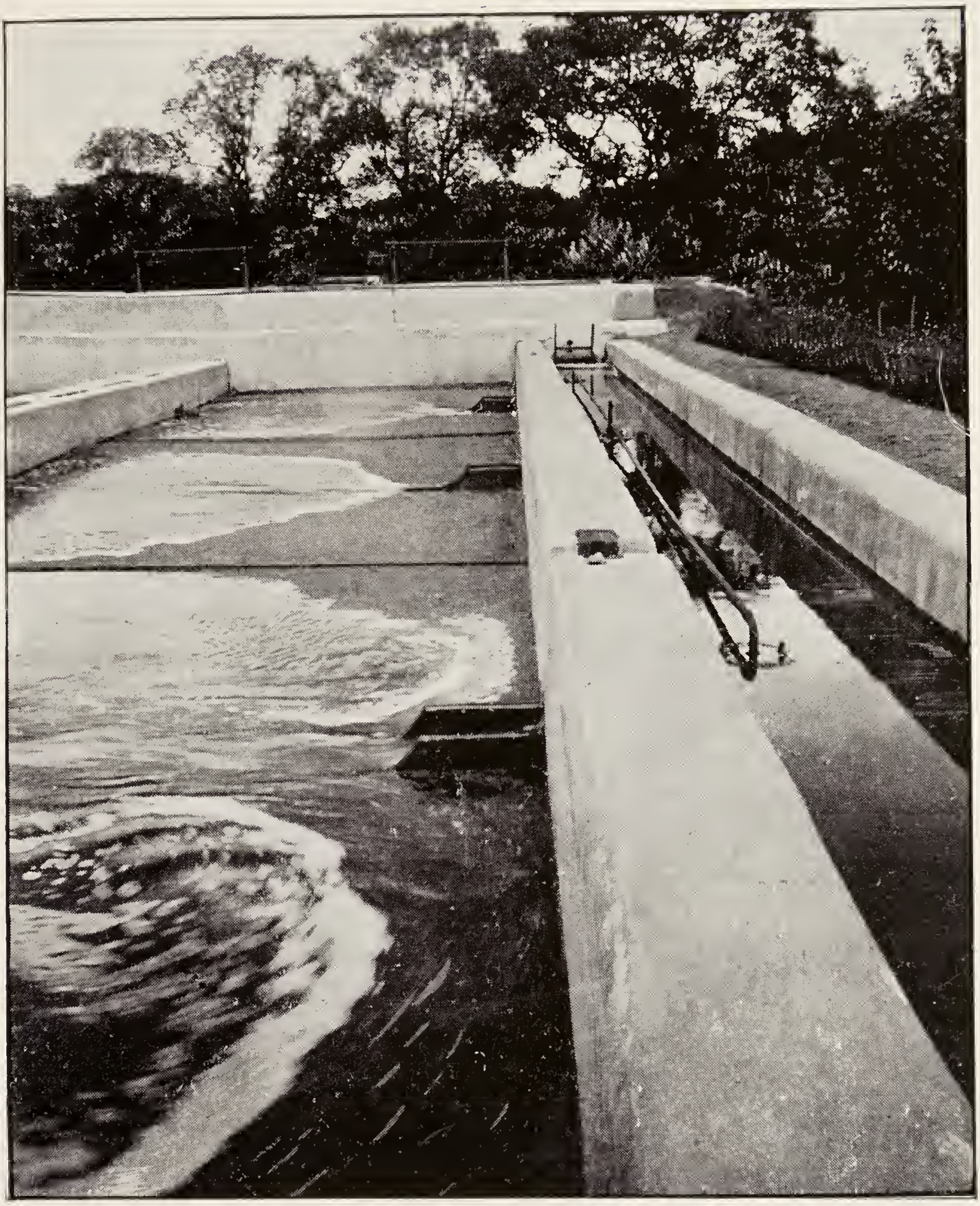


Adams' Patent Connected Automatic Syphons.—(Tank Filling).

THE illustrations shewn upon the previous pages are chiefly of Contact Beds (in which the sewage is held for a given time in contact with the filtrant). That above is of a filter formed of fine material, sand, etc., upon which sewage is delivered from a Dosing Tank by means of connected syphons. The whole surface is flooded with liquid which percolates through the filter and is purified in transit. The illustration shows the Syphon Tank prior to its discharge. It will be seen that three complete syphons are used. They discharge simultaneously the contents of the tank to the filters, thus flooding the entire surface.

Sewage Disposal, etc.

DOSING FILTERS.

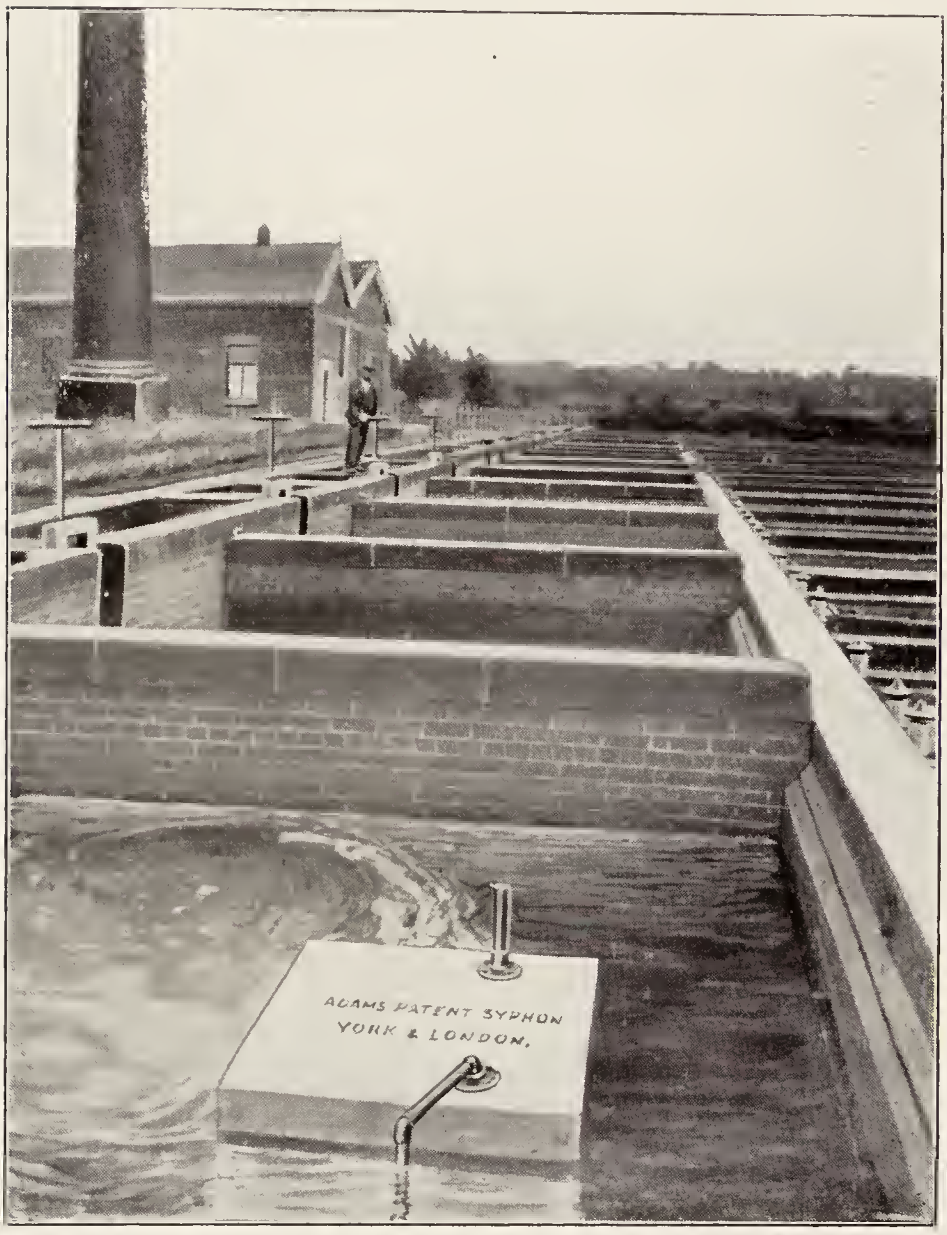


Adams' Patent Connected Automatic Syphons.—(Tank Discharging).
Simultaneous Discharge in Bulk.

THE view above, taken immediately upon the commencement of the discharge from syphons, and before the full flooding of the beds, shows the syphon mouths, through which the sewage is delivered with such rapidity to the beds that the whole area is almost instantly flooded—a point of very considerable importance—the sewage being purified in its transit through the bed. Any number of syphons may be thus connected, or they may be arranged to discharge in sequence.

Sewage Disposal, etc.

DOSING FILTERS.



Chorley, Lancs.

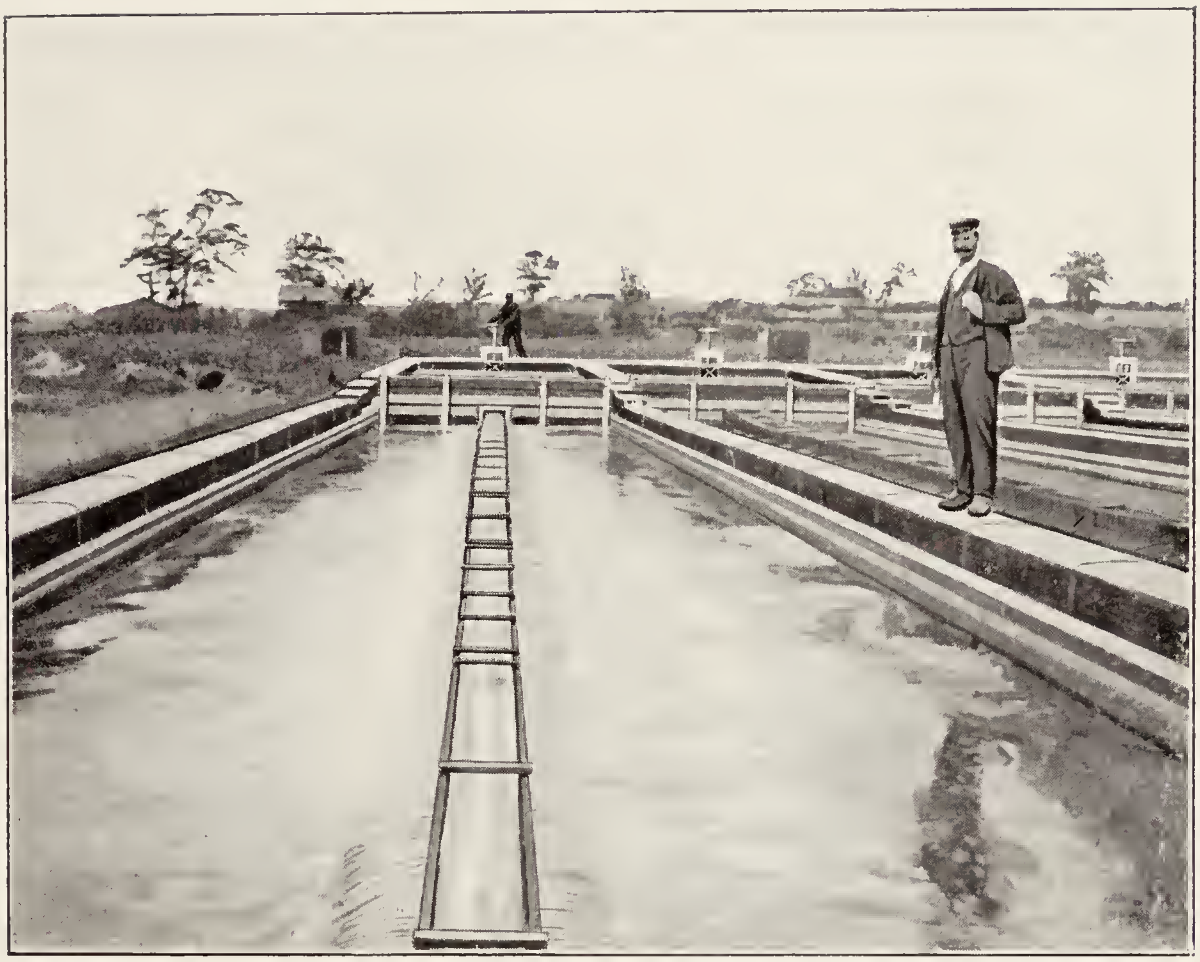
THIS view shews specially constructed syphons used for discharging the contents of a dosing tank to sand filters.

HENRY F. HIBBERT, Esq., J.P., Chorley (Chairman U.D.C.):—

> "The Syphons are working splendidly—they are, in fact, the best we have ever had—they discharge 2,700 gallons in from 1.20 secs. to 1.25 sec. This, as you know, is very good, and has overcome the difficulty we experienced in getting the water on our filters fast enough."

Sewage Disposal, etc.

DOSING FILTERS.



A Long Sand Filter, Chorley.

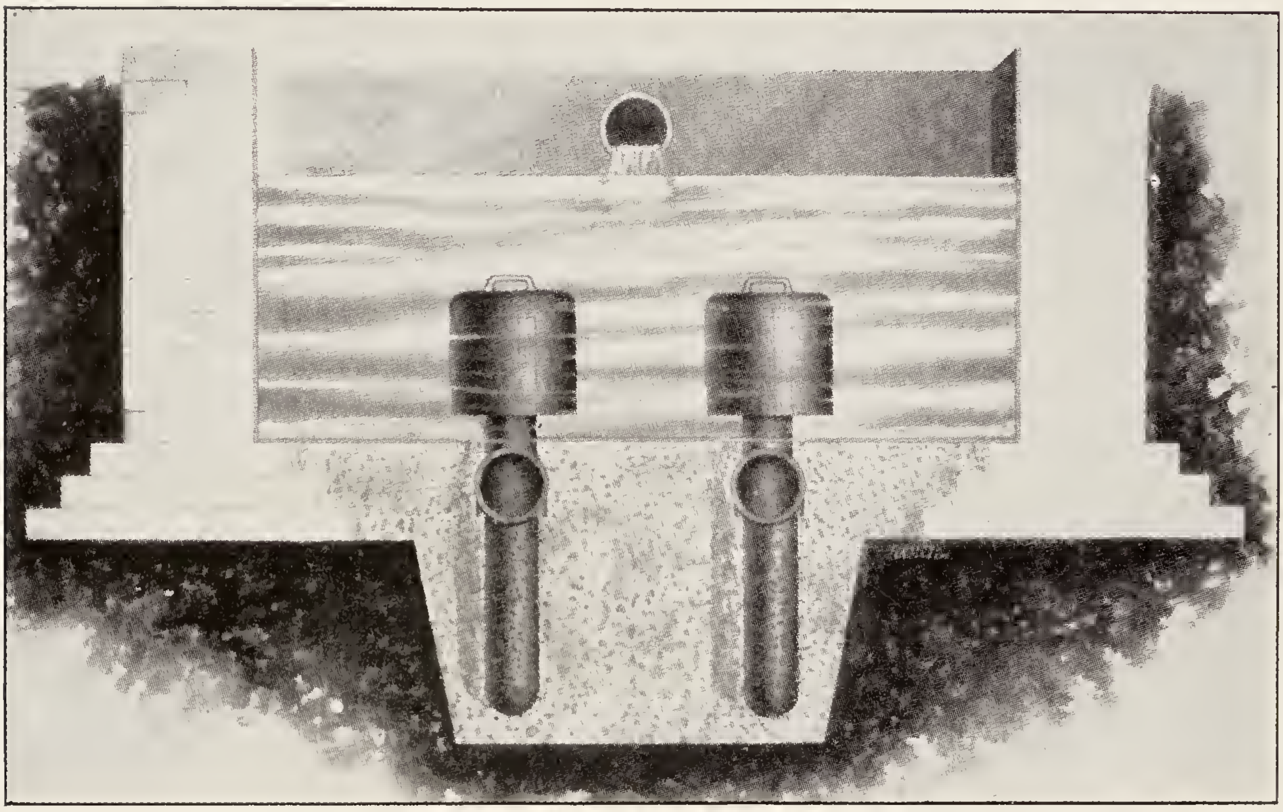
THE above view shews the syphon described upon page 58 in the act of discharging the contents of the dosing tank to the sand filter. The discharge is so rapid that the whole surface is flooded, a point of great importance where such filters are used. The extract below refers to these syphons.

HENRY F. HIBBERT, Esq., J.P., Chorley (Chairman U.D.C.):—

> "The Syphons are working splendidly—they are, in fact, the best we have ever had—they discharge 2,700 gallons in from 1.20 secs. to 1.25 sec. This, as you know, is very good, and has overcome the difficulty we experienced in getting the water on our filters fast enough."

TYPES OF DOSING CHAMBERS.

Adams' Patent Alternating Syphons.



FOR discharging the contents of one Dosing Tank alternately to one or other of two filters, etc. These syphons are so constructed that the first discharge from the chamber will be delivered through one syphon—and the next discharge through the other and so on alternately—in this way one chamber serves for two syphons, and doses two distinct filters.

NOTE.—These syphons and their combination in use are patented—they are the first ever constructed, and Engineers are asked not to encourage by support, unscrupulous copyists.

PRICES UPON APPLICATION.

Sewage Disposal, etc.

TYPES OF DOSING CHAMBERS.

For Discharging to Bacterial Filters, Revolving Distributors or Sprayers, etc.

Adams' Patent Triple Rotation Syphons.

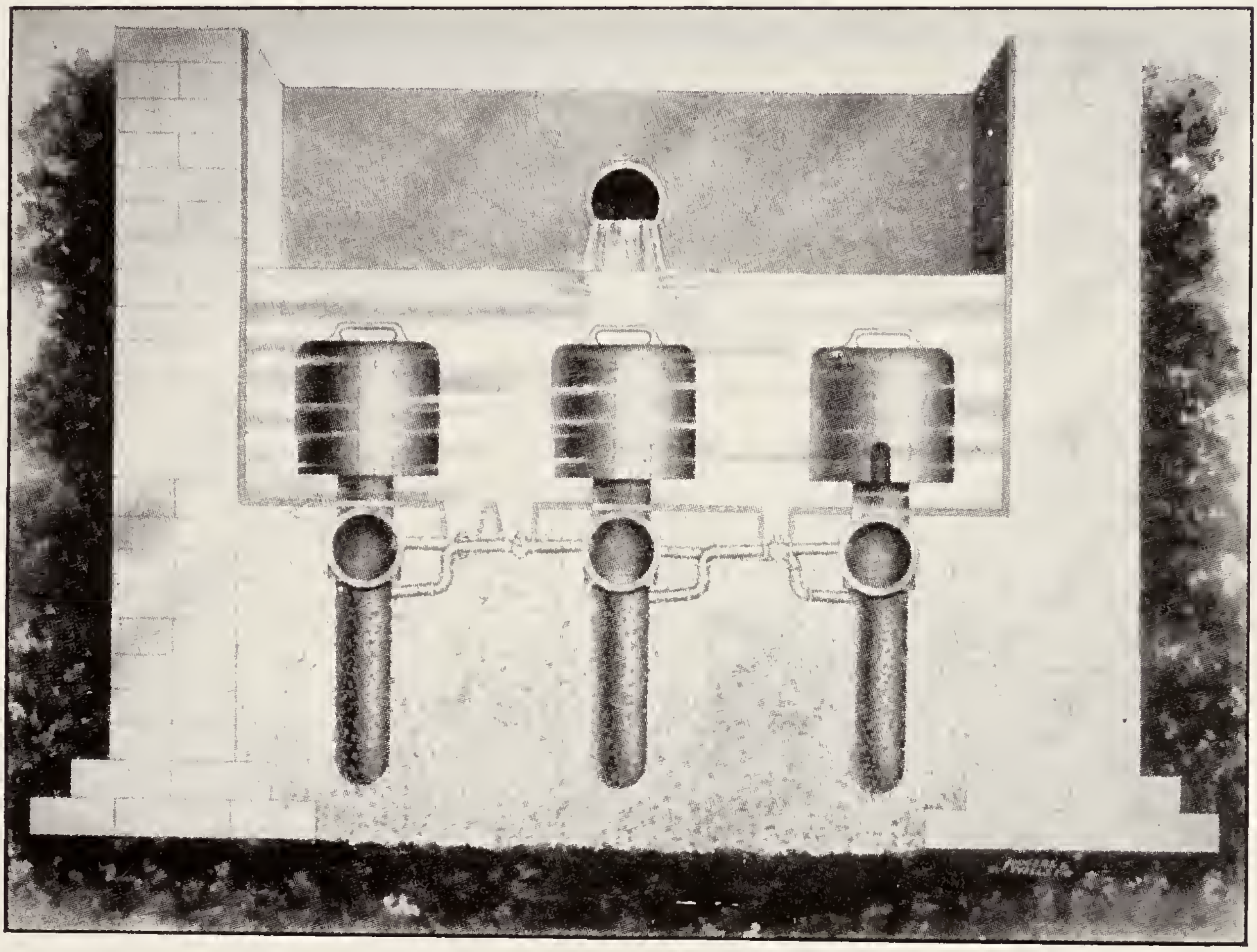


Fig. 103.

HERE three syphons are placed in one tank which thus serves for dosing three distinct filters, (or flushing three distinct sewers), each of which will receive automatically and in turn the entire contents of the tank.

E. J. BARRETT, Esq., U.D.C. Staines, writes:—

> "The 12 Rotation Syphons have proved in every way satisfactory. The working of the syphons has not only given me satisfaction, but has caused considerable surprise to others who have inspected the works."

Sewage Disposal, etc.

(PUMPING ABANDONED.)

ADAMS' PATENT SYSTEM OF MULTIPLE CONTACT BEDS.

A Lateral Streaming System.

Type K.

CONTACT Beds, as ordinarily constructed, can effect in a certain depth a certain percentage of purification only. To carry the purification further it is needful to pass the liquid from the primary to a secondary bed, or even to a tertiary bed. For this a depth is required which frequently cannot be obtained; in such a case the New Multiple System is invaluable. It combines the best features of the Contact Beds, Continuous, and Ladder or Streaming Filters.

As will be seen from the illustration the Contact Bed is sub-divided, the divisions are connected together by means of syphon pipes. The first fills, discharging to the second, the liquid level falling in first bed until both are at the same level. The two beds then fill together, discharging to the third; the liquid will lower again, and finally all divisions becoming full, the entire liquid contents will be discharged to the outfall through the syphon in last bed.

It will be seen that the roughing work is effected in the first divisions and the final work of purification in the last, and that the repeated rising and falling of the liquid recharges the bed with air at each operation, and that the area of total bed and its depth is no more than that required for single contact.

The drawing shews a small installation with the roughing filters in duplicate that one or other may be put out of work for recuperation.

The lateral travel of the sewage aids very largely in its purification.

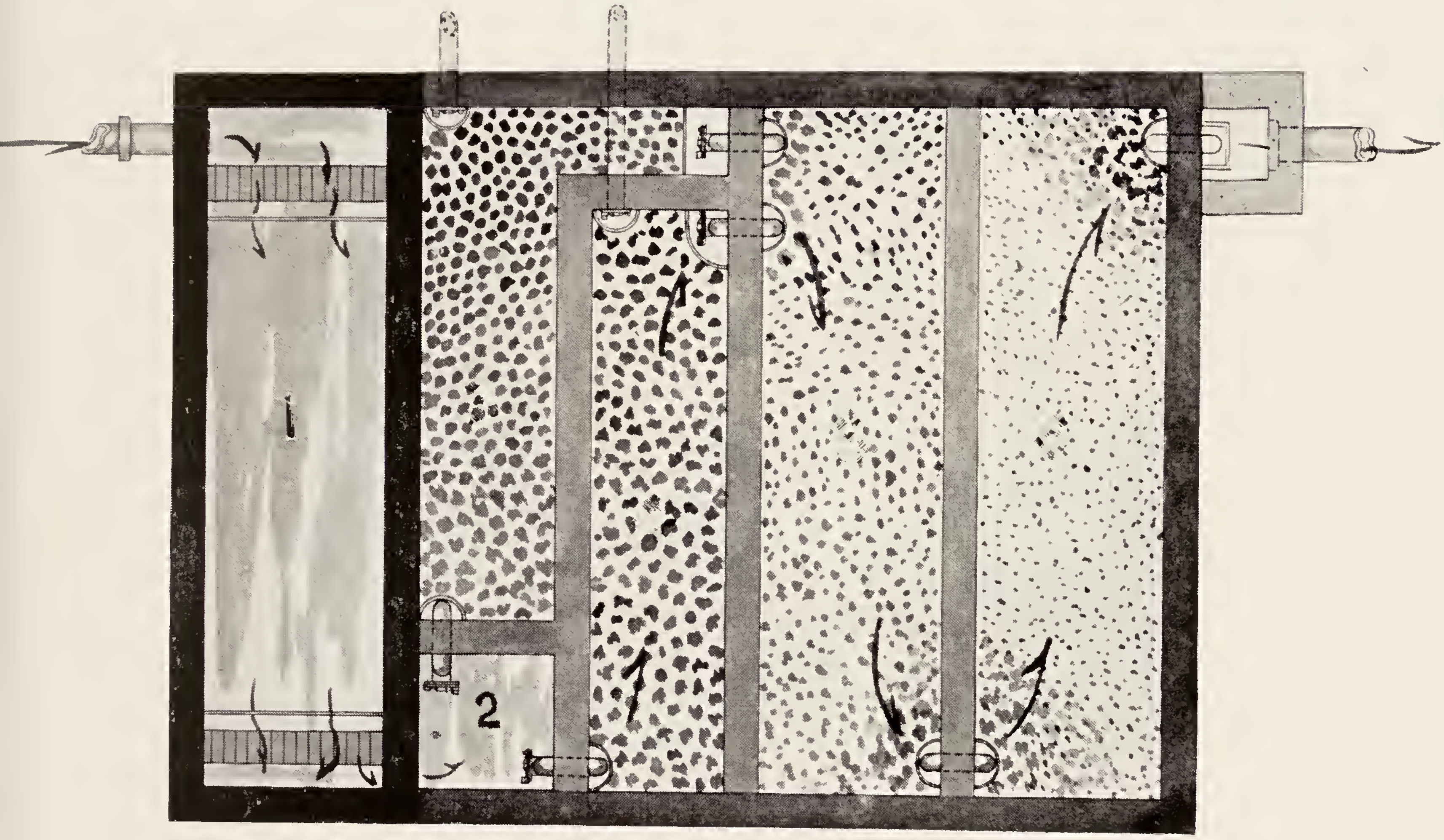
☞ See page 55 for view of the New Beds at Sutton, laid down on this principle to save cost of pumping.

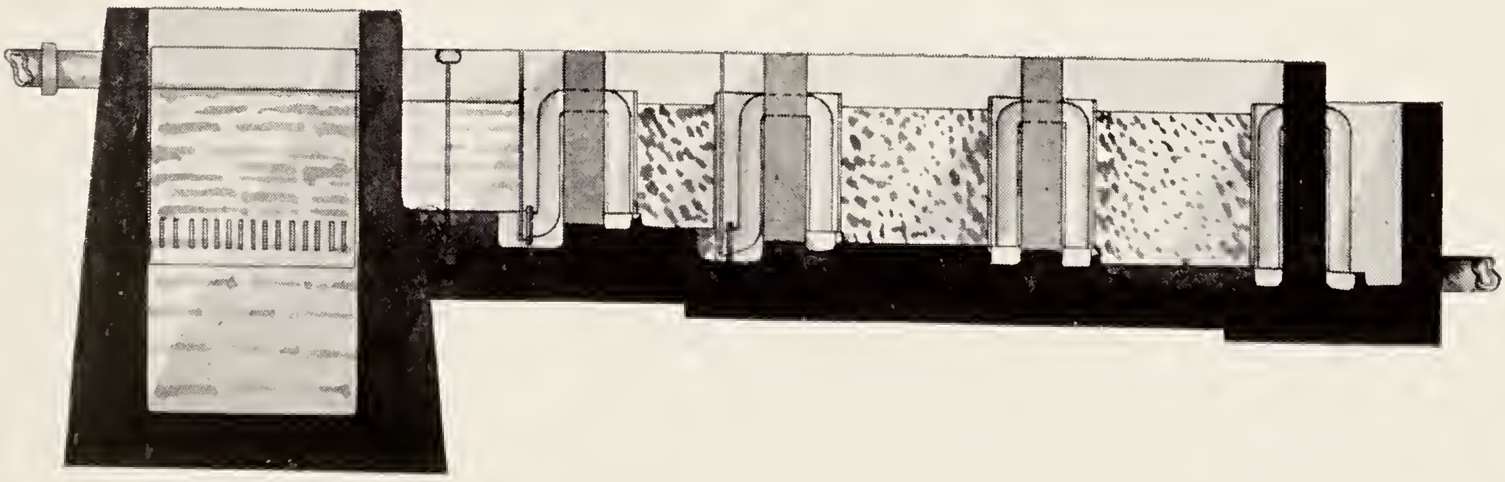
Sewage Disposal, etc.

ADAMS' PATENT SYSTEM OF MULTIPLE CONTACT BEDS

Will purify Sewage upon a depth which is entirely valueless for any other system.

Type K.

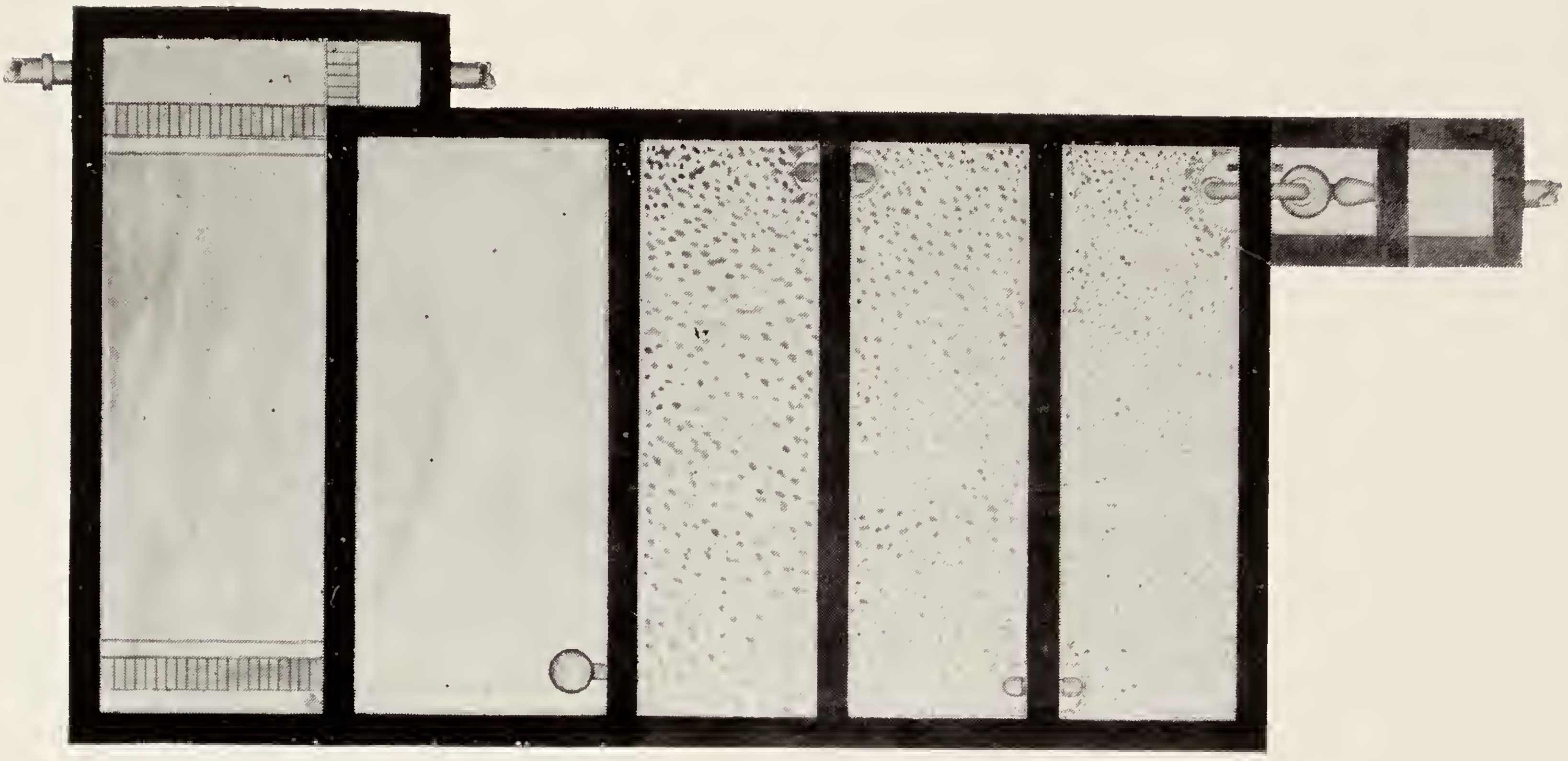


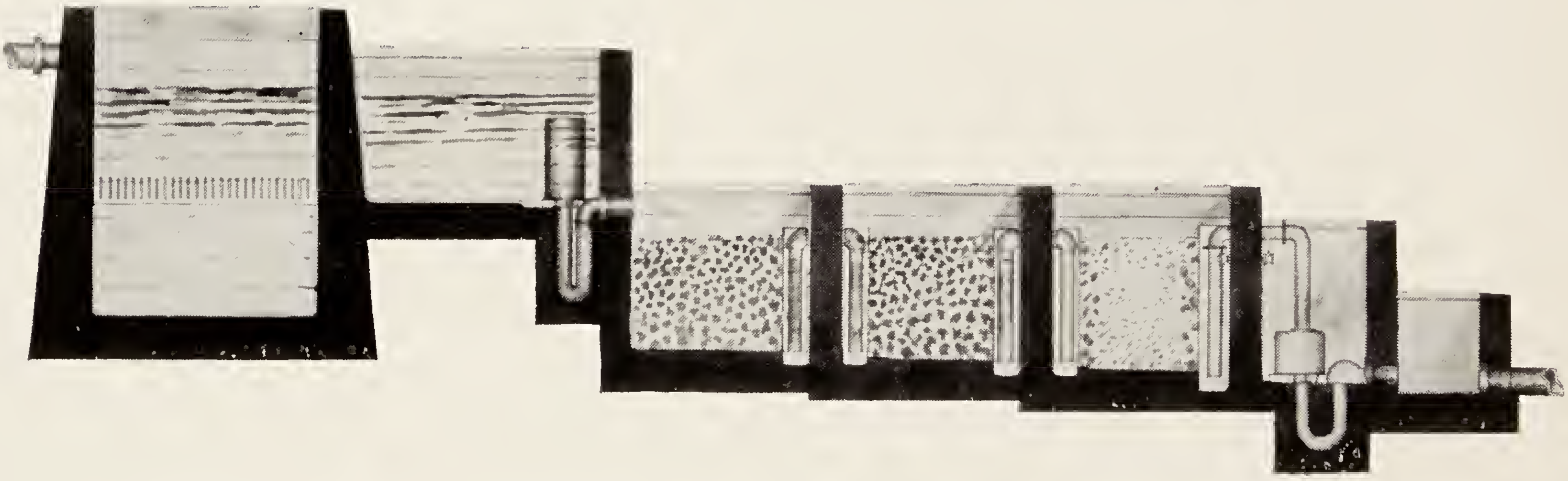


Sewage Disposal, etc.

ADAMS' PATENT MULTIPLE CONTACT SYSTEM, WITH DOSING TANK.

Type K1.





ADAMS' PATENT MULTIPLE CONTACT, or Sub-divided Contact Bed, is valuable in all positions as giving greater purification upon a less area, but especially where fall is limited.

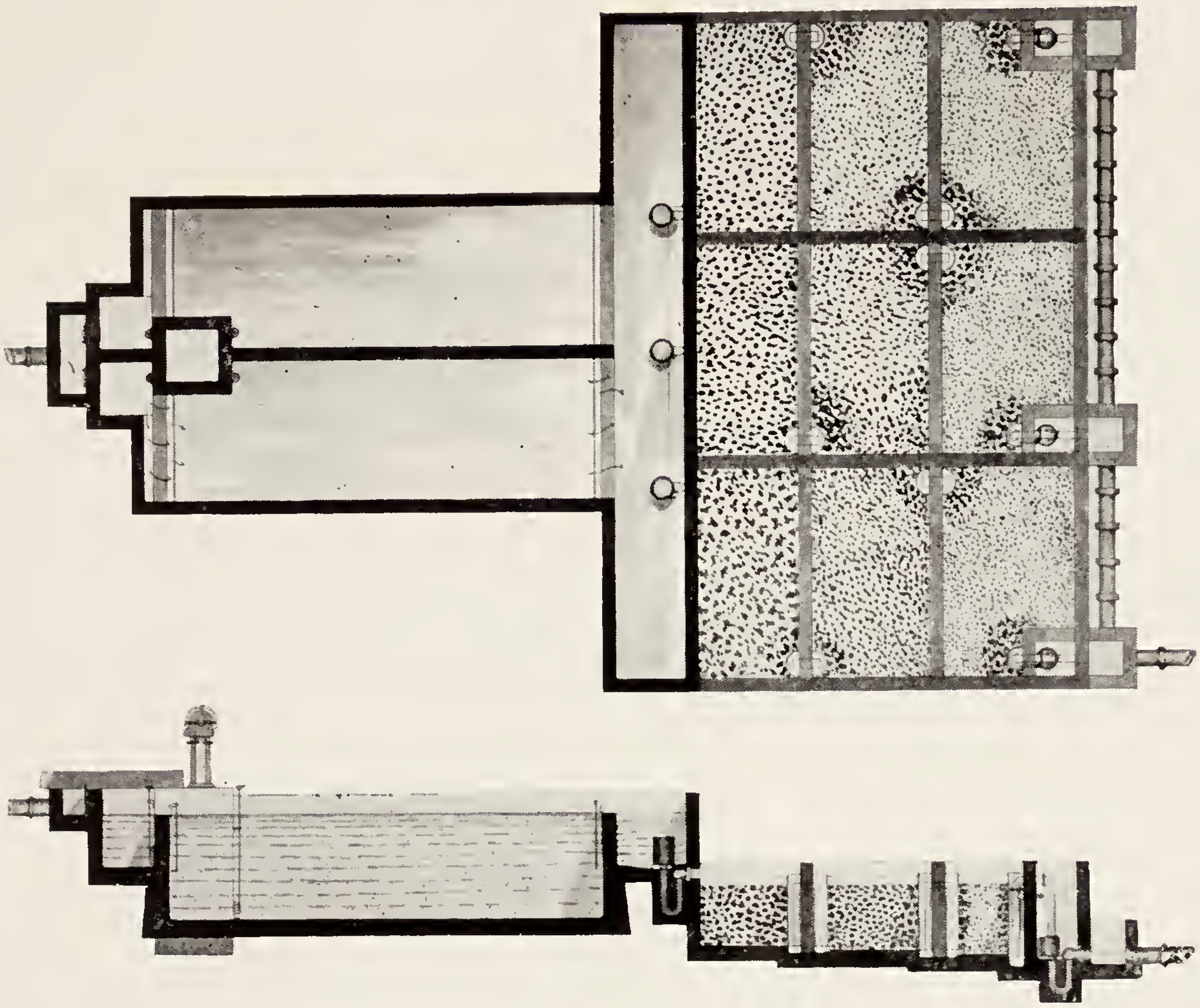
THE DRAWINGS above shew plan and section of simple installation. In this instance sufficient depth for a dosing tank is available. Liquid enters the catch pit, overflows a weir wall, passes through the perforated scum plate, through the tank and upwards through the outlet scum plate, over the weir, and thus to dosing tank, from whence it is discharged automatically by a syphon to the sub-divided bed. Syphons discharge the liquid from one division to the other, and finally the timed syphon discharges the entire liquid contents of the series to the outfall.

IT will be seen that the treatment is by triple contact, and that this is obtained in the depth of a single contact bed.

Sewage Disposal, etc.

ADAMS' PATENT ROTATION SYPHONS AND MULTIPLE BEDS.

Type K3



THE drawing above shews three sets of sub-divided or multiple contact beds; these receive their supply from a dosing tank which is common to all. The latter is fitted with three of Adams' Patent Syphons, which discharge the contents of the tank to each complete bed in rotation; the first division of a bed fills and overflows to the next, starting the syphon, both divisions fill then to the same level, they in turn discharge to the final division, and this to the outfall. The next discharge from the dosing tank is delivered to the adjoining bed, the third is dosed in its turn, the cycle being continued indefinitely. A sludge chamber is arranged in such a way that one pump may serve to raise the detritus from the two sedimentation tanks. The arrangement shewn is especially valuable owing to the long interval of rest for aeration given to each bed.

E. J. BARRETT, Esq., U.D.C., Staines :—

> "The 12 Rotation Syphons at our outfall works are in every way satisfactory. The rotation in triplicate is simply effected, the working of the syphons has not only given me satisfaction, but has caused surprise to those who have seen them, &c."

☛ Where our Alternating or Rotation Syphons are used, any number of beds (from two upwards) may be dosed in sequence.

Adams' Patent Multiple Contact System, Operated by Feeds.

Type K4.

ADAMS' PATENT MULTIPLE CONTACT, or Sub-divided Contact Bed, is valuable in all cases as giving greater purification upon a less area, but especially where fall is limited.

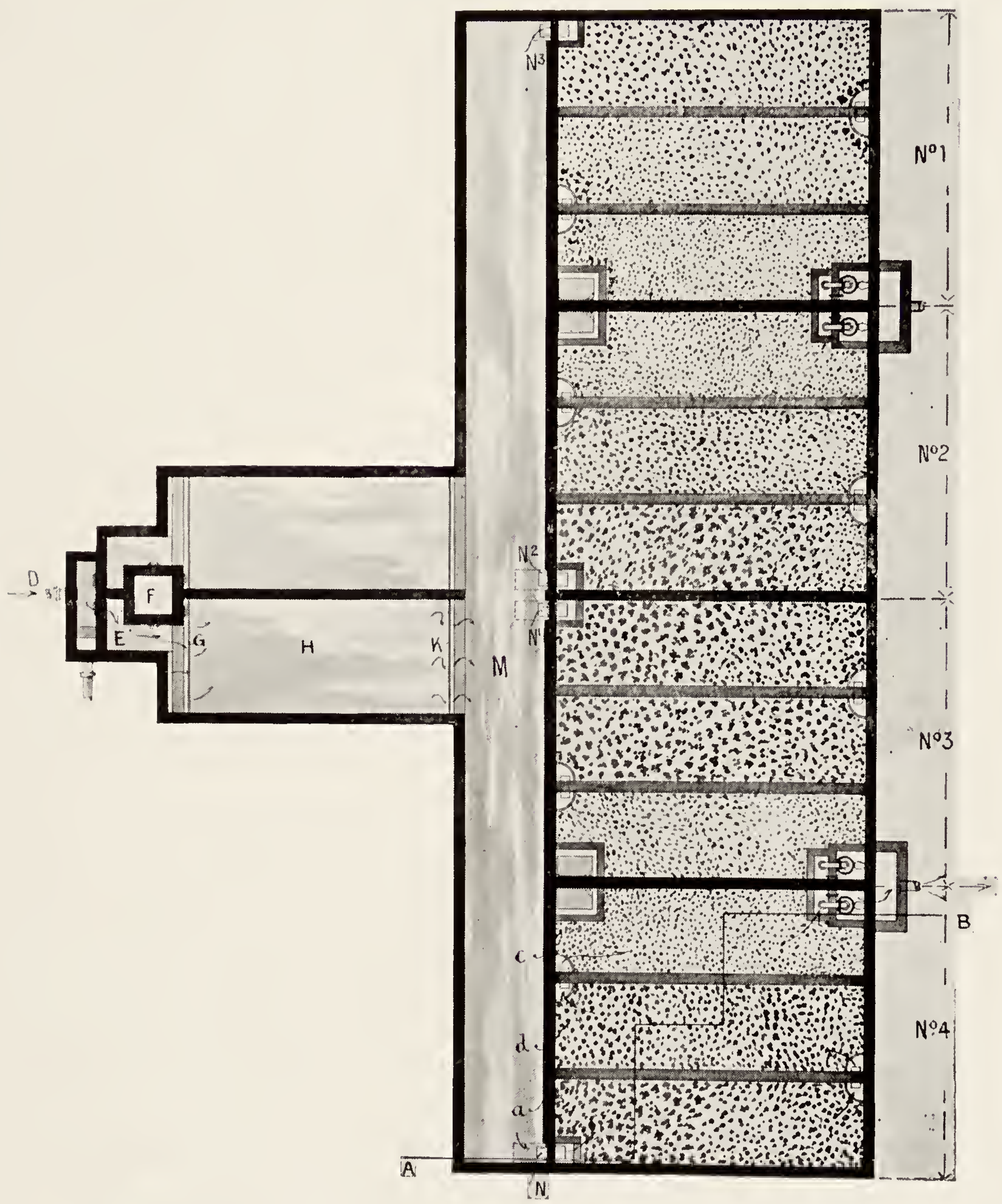
THE DRAWINGS shew beds arranged where the available fall is slight, but sufficient to allow of the use of a collecting tank of 1 ft. in depth. This tank runs the total length of the beds. The liquid is discharged from it by means of our patent sewage feeds. The beds receive their supply in rotation—they are sub-divided—the liquid is discharged from division to division by means of syphons, and the whole finally by means of the timed discharge syphons. The pump well—common to both divisions of the liquefaction tank—and the grit chamber, is fitted with a suitable pump for removal of the insoluble matter which may enter with the sewage. Bed No. 1 fills stands full and discharges, beds No. 2, 3 and 4, following in their turn, the cycle then being repeated. Any one bed may be cut out for rest, etc.

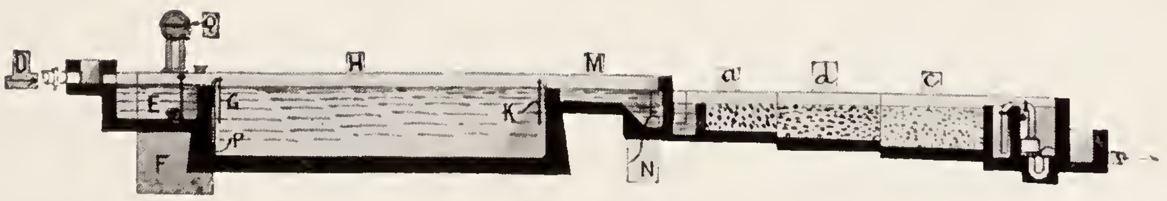
The great advantage of this system lies in the fact that multiple contact is obtained in the depth of a single contact bed—and practically upon the same area. Constructional cost is thus reduced to one half for the beds.

Sewage Disposal, etc.

ADAMS' PATENT MULTIPLE CONTACT SYSTEM.

Type K4.





Sewage Disposal, etc.

Type L.

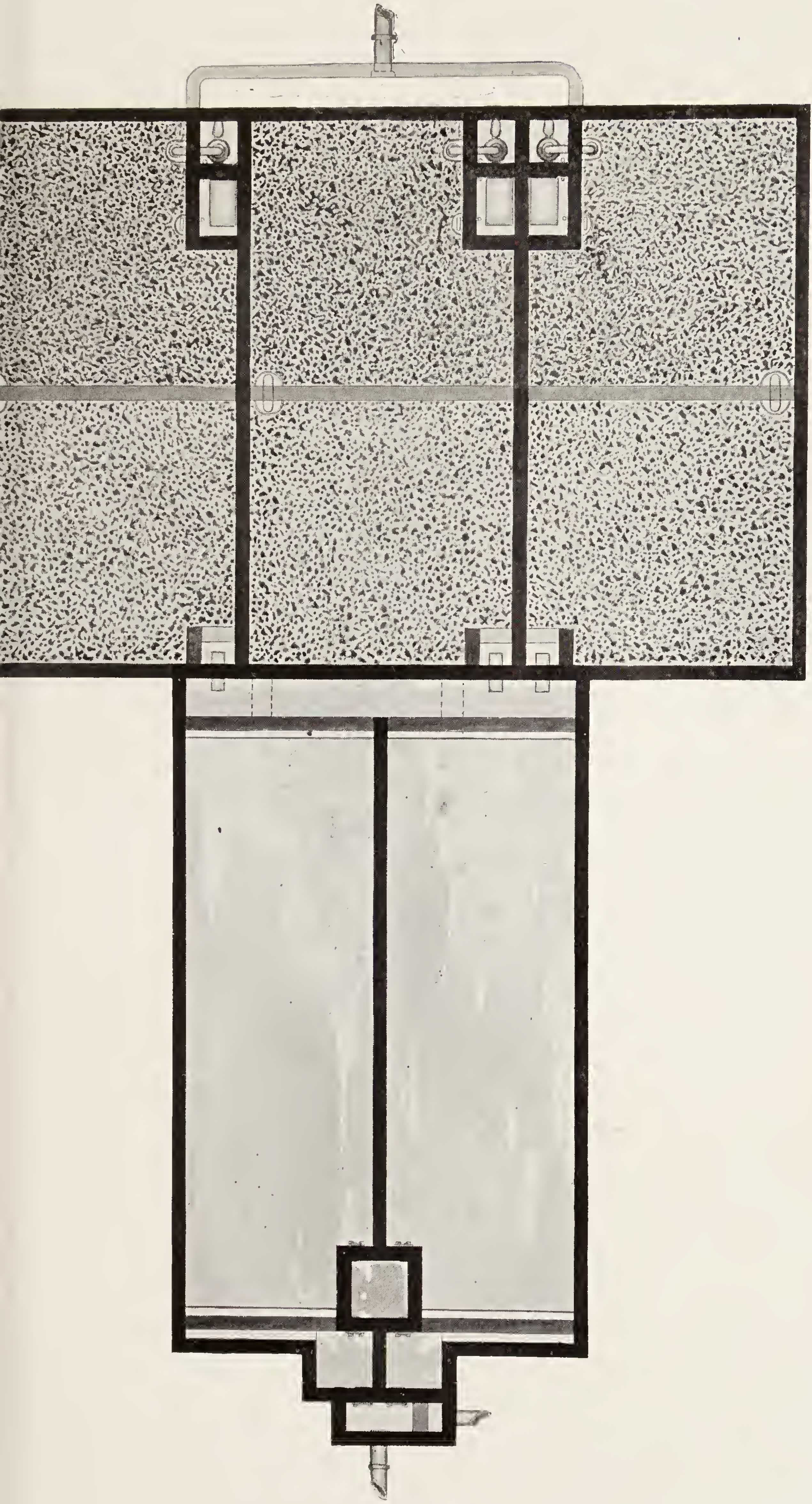
THE drawing on opposite page shews preliminary open Sedimentation or Septic Tanks, inlet and outlet weirs and scum plates, with three beds which receive their supply from a common channel—the latter is fitted with the Automatic Air Lock Feeds, by means of which sewage is delivered as it arrives to each bed in rotation. The beds are sub-divided, they fill, stand full, and are discharged after contact by means of Timed Syphons—the latter draw off the entire liquid contents of the bed and the drippings as they are given off. Under suitable conditions Penstocks may be used in lieu of Syphons to control the filling and emptying of the beds; the intermediate Syphons will still be required. The sewage will be streamed through each bed for a given time whilst the others remain in rest.

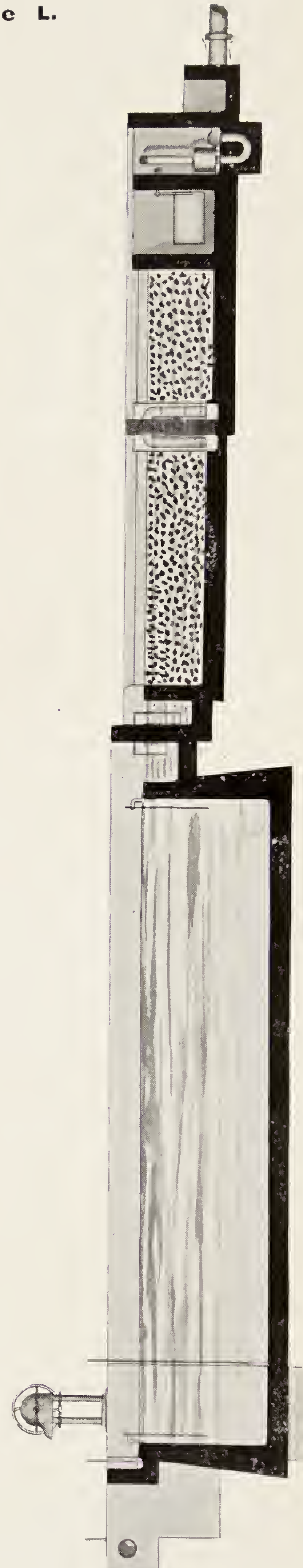
Messrs. HEATON, RALPH & HEATON, Civil Engineers, Wigan:—

> "The Syphons you have fixed at the discharging ends of the filter beds for the Abram Urban District Council entirely empty the beds, and the entire automatic installation you have provided for filling and discharging the eighteen beds is working most satisfactorily."

Sewage Disposal, etc.

Type L.





Sewage Disposal, etc.

FLUSH TANK DISCHARGING TO PERFORATED FIXED SPRAY PIPES.

WHERE desired, sewage may be first treated upon a Contact Bed, and the resulting effluent sprayed upon a Filter. The view upon opposite page illustrates such a case. It will be seen that the purification is brought about by a combination of the "contact" and "continuous" systems. The sewage first enters a storage tank, from which it is raised by wind power to a channel supplying the two primary beds. It is delivered to one or other of these by means of the patent feed apparatus, the supply being automatically shut off from one bed, when full, and diverted to that adjoining. The sewage is held up in contact with the filtrant for two hours, at the expiration of which time it is discharged automatically through controlled syphons to a series of perforated pipes laid upon the surface of the secondary bed, upon which it is delivered in a fine spray, which ceases only when the whole of the liquid from a primary bed has been drawn off. Both primary and secondary beds are thus alternately in rest and work. The discharge of sewage from a syphon dosing tank through fixed perforated pipes is satisfactory where a sufficient depth of tank can be obtained to deliver the sprays over the whole area.

RE ADAMS' PATENT DISC VALVE.

J. R. LUPTON, Esq., Surveyor, Lanchester :—

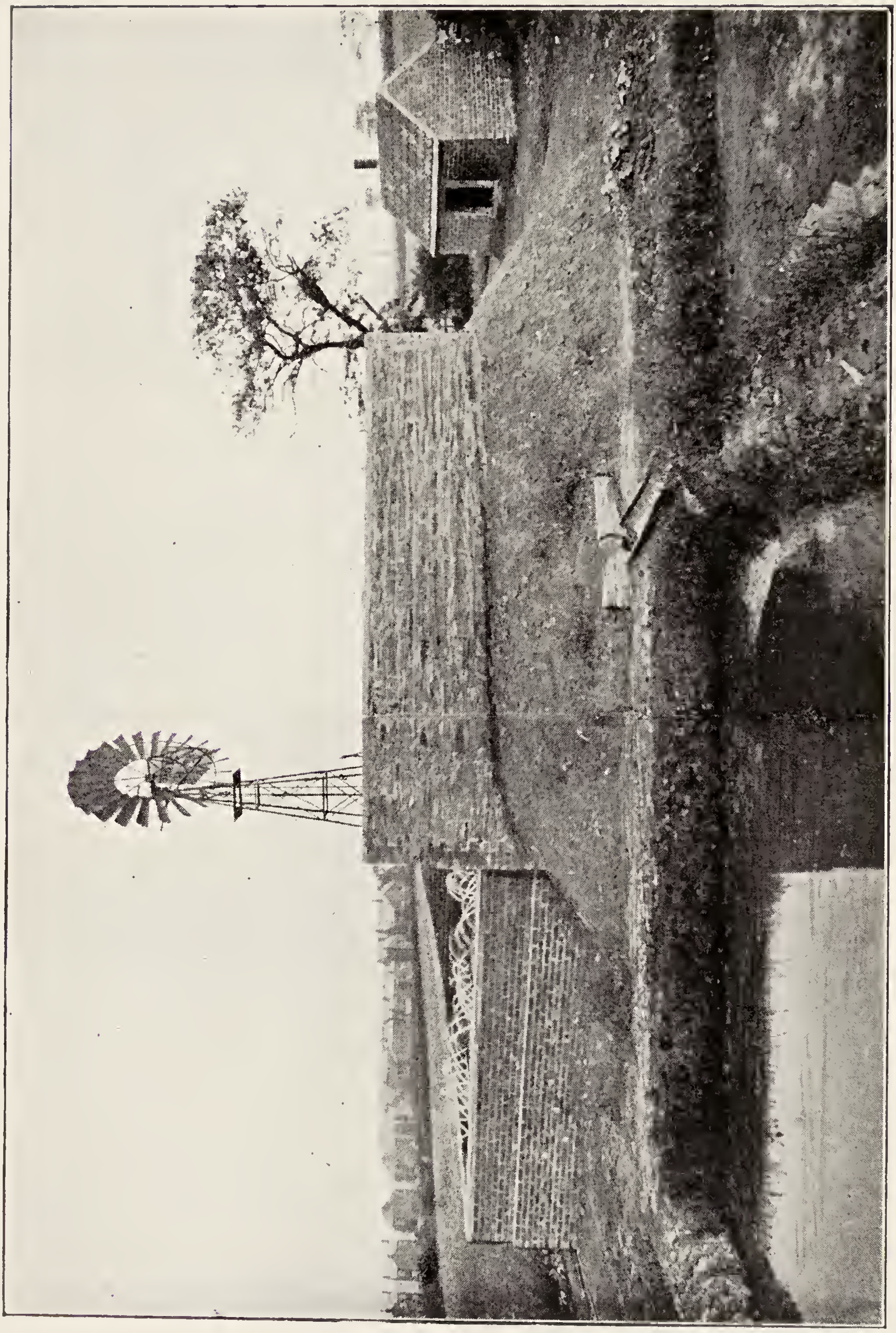
"I am very pleased with them, they are by far the best I have had."

S. J. L. VINCENT, Esq., Town Hall, Newbury :—

"I have your Cresset Disc Valves in use as outlets for Bacteria Beds, and find them simple and effectual—they are certainly the best I have seen."

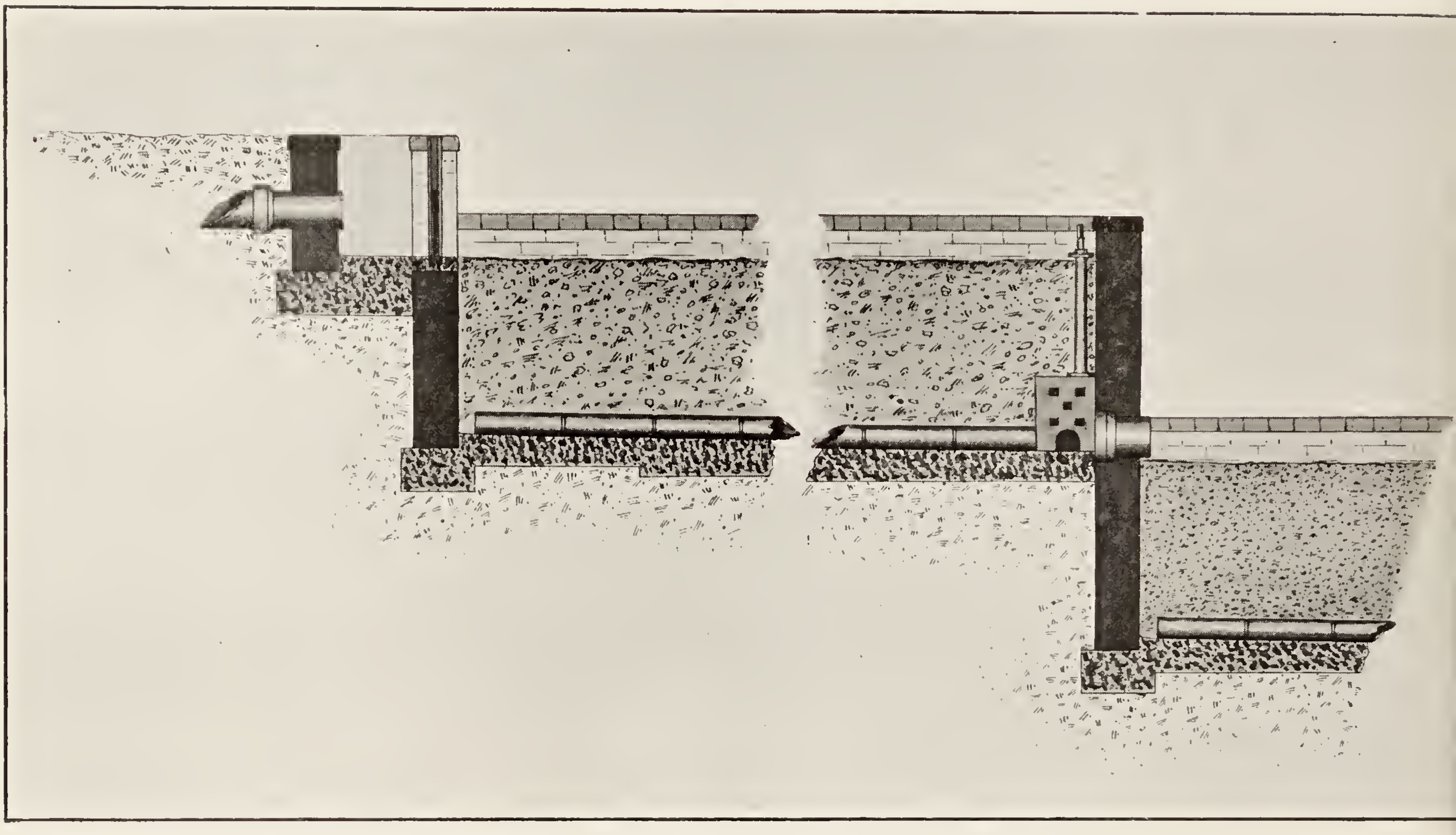
Sewage Disposal, etc.

SPRAY FILTERS.



Syphon discharging Sewage to fixed Spray Pipes.

Sewage Disposal, etc.



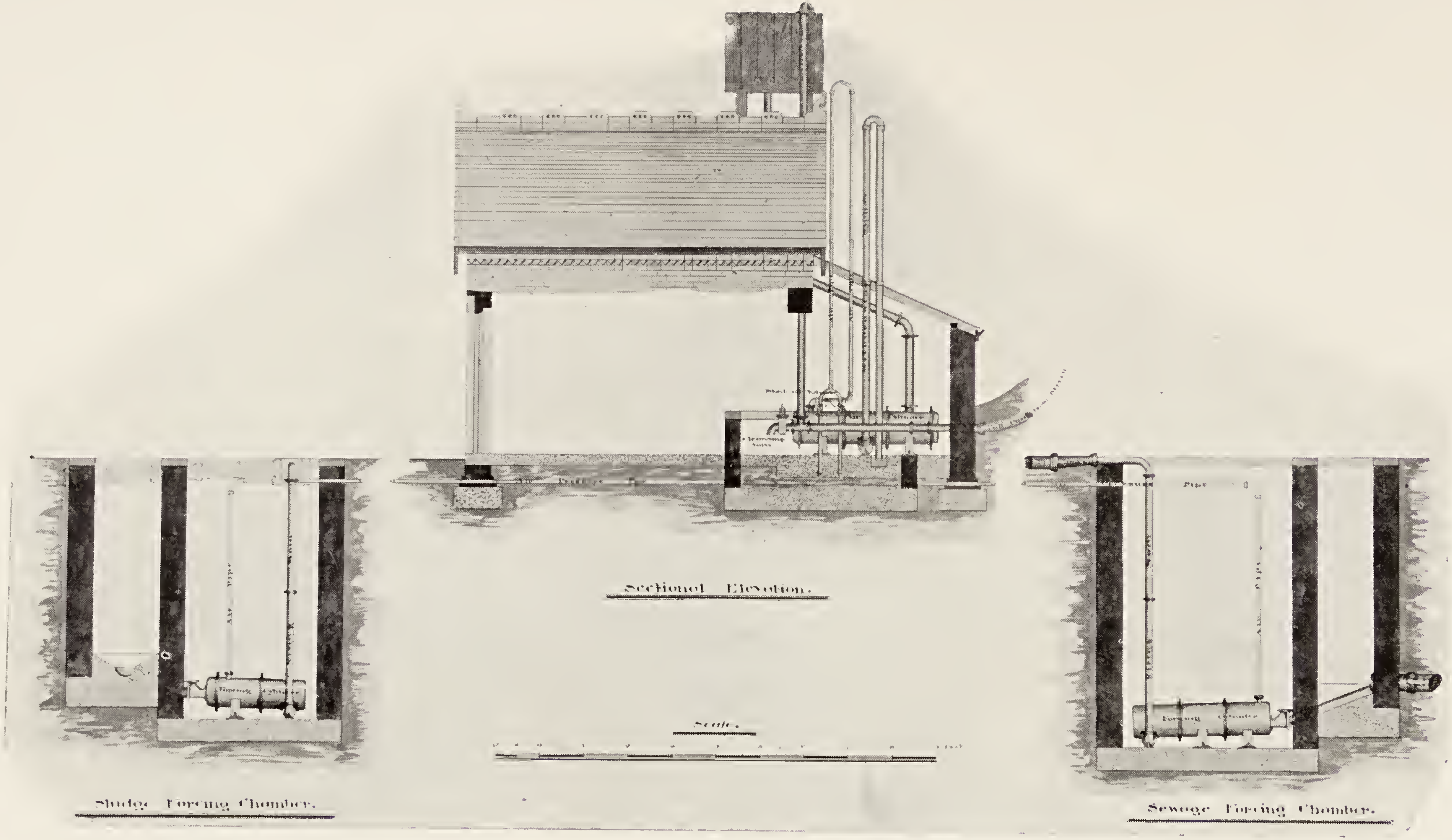
Adams' Patent Draining Box and Valve for Hand Operated Beds.

WHERE it is desired to operate beds by hand, the special fittings shewn are very valuable. A sluice regulates the supply to the bed; the discharge is through the Draining Box—this encloses a valve which is adjusted from above. The box is freely perforated in order to allow the drainage of the bed; it is provided with openings for the sub-drains, which are blocked when the latter are not used.

J. ROBINSON, Esq., Darlington, says of our Patent Disc Valve:—

> "I have used your Disc Valves for the past four years and have found them most satisfactory."

Sewage Disposal, etc.



Adams' Patent Sewage Lift, Ebchester, lifting Sewage and Sludge.

THIS drawing shews a Sewage Lift which raises the low level sewage of a district (by means of the high level sewage) to the purification works, which thus serve for both high and low level areas. This Lift is so arranged that it serves also to raise the sludge from the sludge wells.

Sewage Disposal, etc.

ADAMS' PATENT COMBINED TANK AND FILTER.

OUR Patent Combined Liquefaction Tank and Filter is illustrated at page 75. In this instance the Tank is circular in plan in order that its roof (carried upon iron joists) may form a floor for the percolating filter above. The Sewage passes by way of the manhole through the tank and upwards to the supply pipe of the Revolving Distributor. The Distributor itself is described more minutely upon page 82. It will be seen that one segment of the filter is composed of our patent tile or slope—the latter is so placed that the liquid falling upon it passes downwards and through the filter at an inclination which ensures a length of travel about one-third greater than that otherwise obtainable. The filtrant of another segment represents clinker granite or other material. The sub-drains, placed herring bone fashion, and air inlet pipes are shewn in other segments. This combination of Filter and Tank not only ensures greater compactness, but it hides from sight the often unsightly tank area. The same combination is used in connection with bacteria or other rectangular beds.

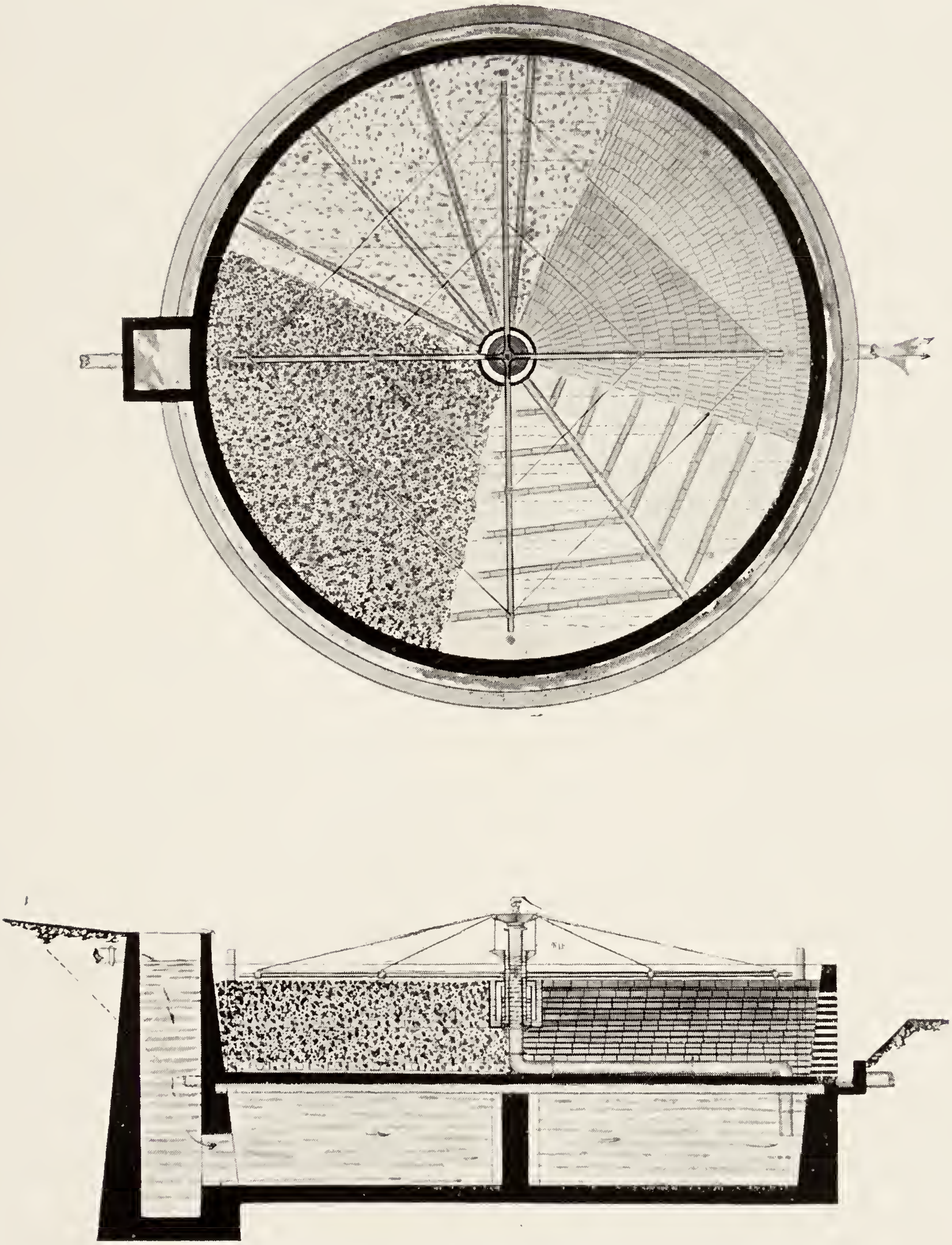
T. FOSTER, Esq., Hoylake:—

> "The Sewage Lift has worked continuously for 3½ years—it requires practically no attention, and is only inspected once per month. I can recommend it as an economical and efficient method of raising sewage."

URBAN SMITH, Esq., C.E., Parliament Street, S.W.:—

> "I am not in the habit of giving Testimonials in matters of this sort, but I have nothing but good to say with regard to your Syphons. I used to regard them as somewhat expensive, but having tried cheaper patterns, I have come back again to yours, which have always worked—as far as my experience goes—very satisfactorily."

Sewage Disposal, etc.



Adams' Patent Combined Liquefaction Tank and Filter.

Sewage Disposal, etc.

ADAMS' PATENT COMBINED TANK AND FILTER.

THE drawing on opposite page shews the construction of our new combined Liquefaction Tank and Filter. As will be seen, the Tank is below the filter; sewage enters the manhole at inlet end, it travels through the tank, rising at the extreme end, and is delivered upon the surface of the filter in the ordinary manner. Whether for a contact or percolating filter this system is equally valuable—it not only economises space and so reduces the area of land ordinarily required, but makes a much more compact and equally efficient scheme.

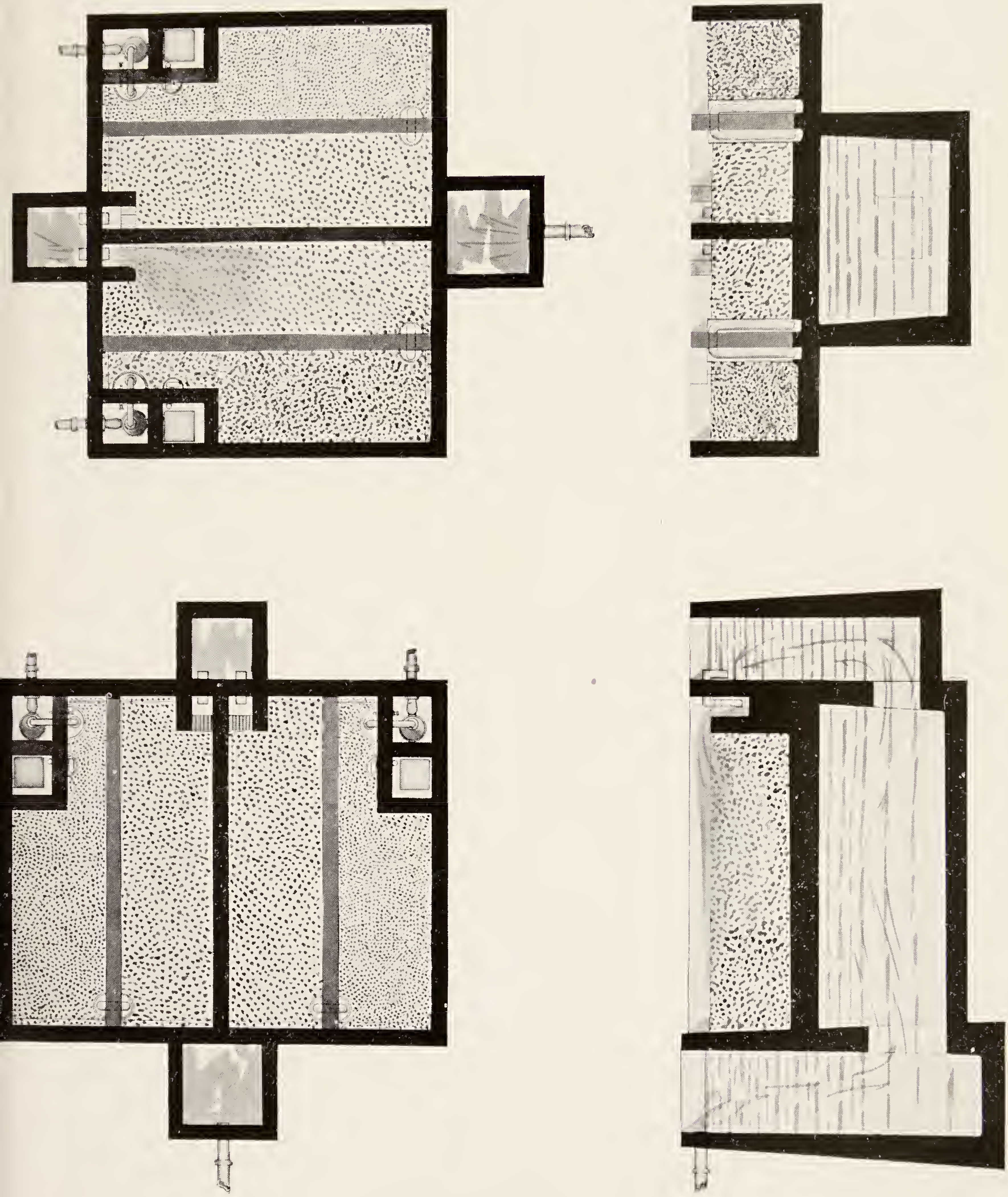
Messrs. DIBDIN & THUDICHUM, Consulting Chemists, Westminster, S.W.:—

> "We have been largely associated with you in the introduction of the Automatic Syphons for Bacteria Beds which have been fitted by you in a number of cases in which we are interested, and in every instance they have given the most unqualified satisfaction."

A. G. MCBEATH, Esq., Engineer U.D.C., Sale:—

> (Of a 20″ dia.):—"During the years it has been in operation it has given every satisfaction. It works to-day in the same efficient manner as when first started."

Sewage Disposal, etc.



Adams' Patent Combined Tank and Filter.

ADAMS' PATENT CRESSET DISTRIBUTOR.

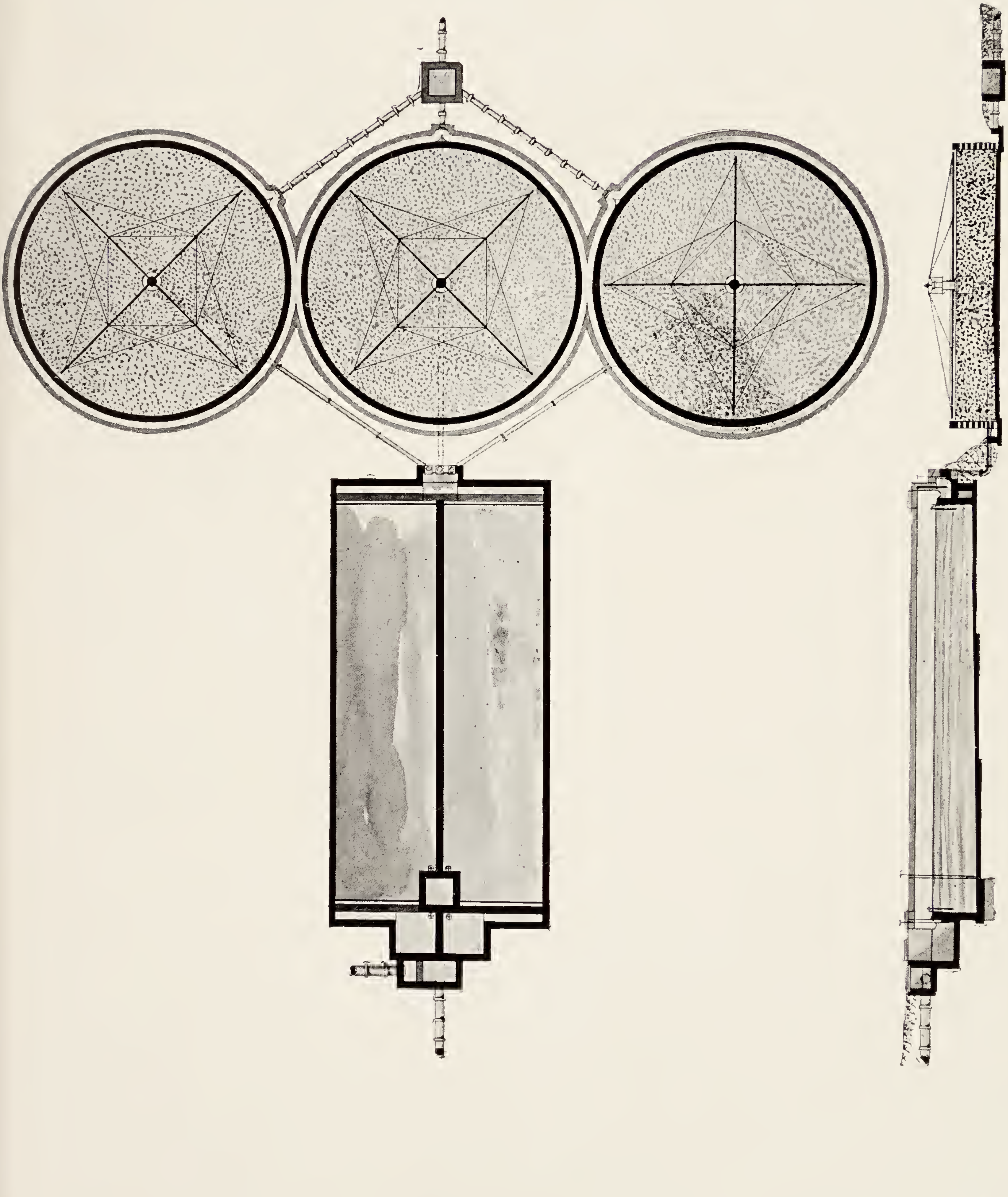
Bacterial Filters.

THE drawing upon next page shews a very convenient arrangement of Tanks and Filters. It will be seen that sewage first enters a small overflow chamber, from this it passes to the sedimentation tanks (one or other or both of which may be used). It enters and leaves the tanks over weir walls and under scum plates. A small collecting chamber at the outlet of the tanks is common to both—in this chamber the valves controlling the supply to the Distributors are placed. It is desirable to use weir valves to govern the supply to the Distributors—in such a case the minimum supply will pass to one filter, an excess over this to another, and finally the maximum supply to the third filter. Our patent weir valve and gauge is designed specially for this use. The Fig. 73, Sluice Valve (see iron-work section), is also well fitted for controlling the supply to filters of this type.

In installations where the volume of sewage decreases at night to such an extent that it is insufficient to cause the Distributors to revolve, a Dosing Tank must be used. The discharge apparatus shewn at page 84 is then very valuable.

☞ See page 80 for Regulating or Fixed Quantity Weirs.

ADAMS' PATENT CRESSET DISTRIBUTOR.



Sewage Disposal, etc.

ADAMS' PATENT GAUGE WEIRS.

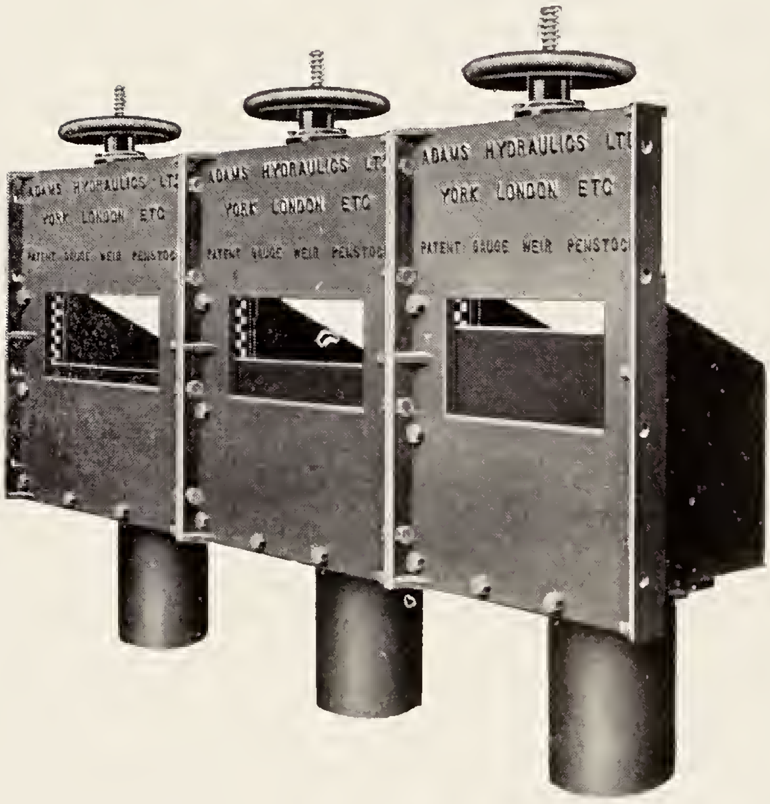
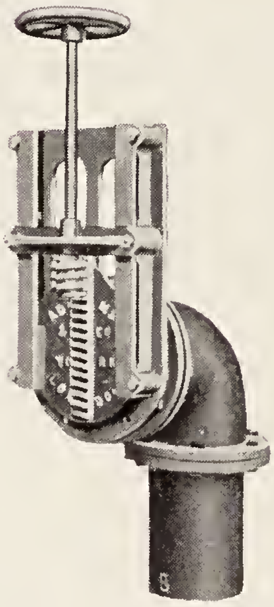


Fig. 1.



See page 119.

THE illustration shews three of the Patent Gauge Weirs connected together, with their weirs set at different levels. The height of each weir is regulated at will, so that the total flow is divided over the series in any desired proportion, or one may serve as storm overflow. Each weir has a gauge shewing volume flowing over.

THOS. R. SMITH, Esq., Kettering, says of 44 of our Sewer Flushing Syphons, selected after tests of those manufactured by other makers:—

> "The whole of the 44 Automatic Syphons you supplied are working satisfactorily. I send you an order for two more."

Sewage Disposal, etc.

ADAMS' PATENT FIXED VOLUME WEIR.

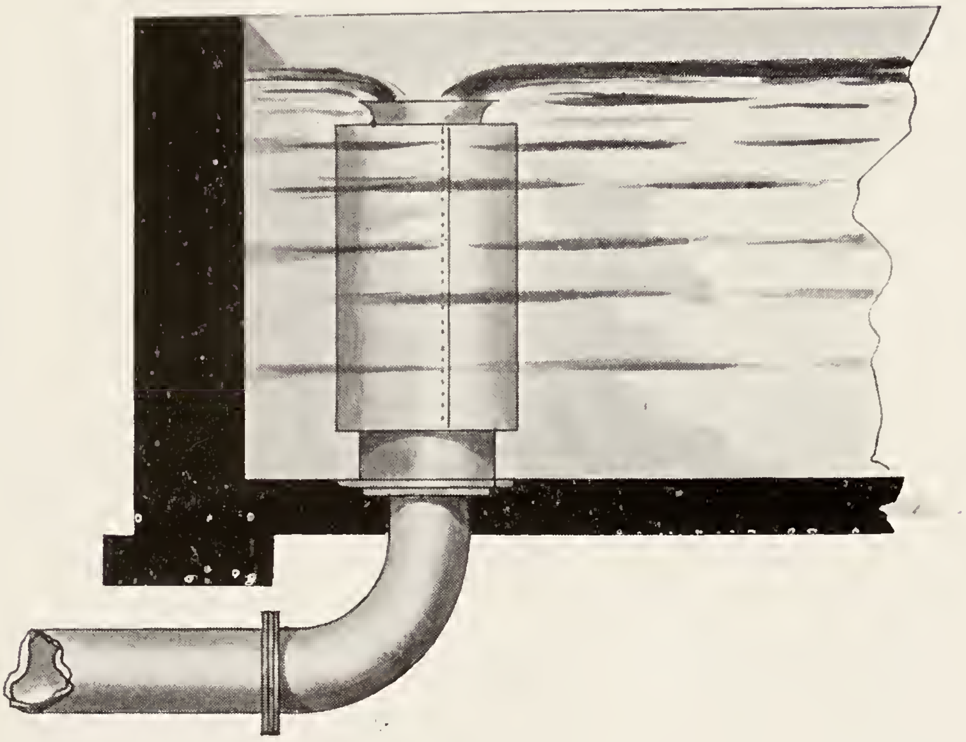


Fig. 2.

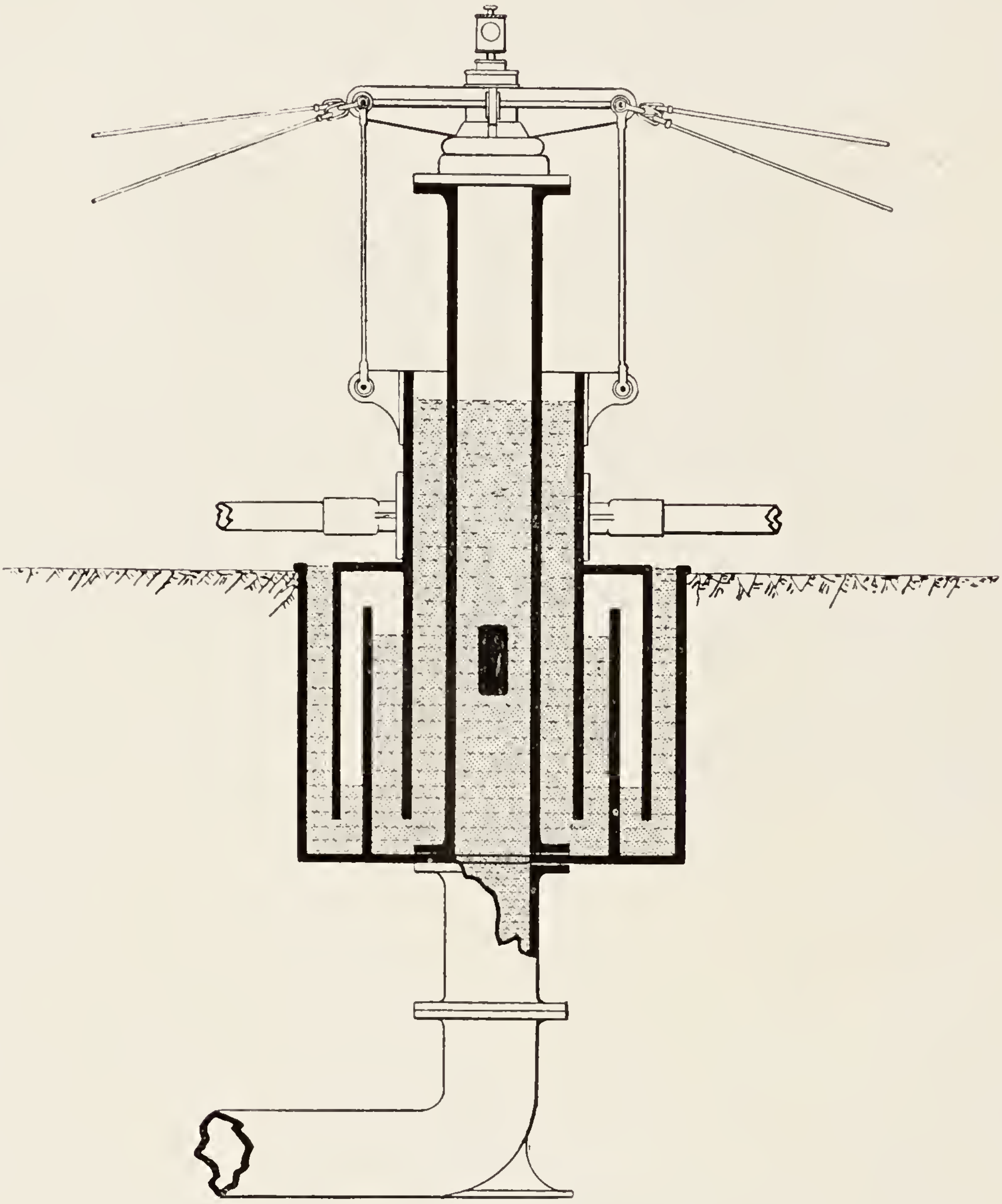
THIS apparatus is so constructed that it rises and falls with the level of liquid in tank. Its mouth remains at a constant level below the surface, (rising and falling with the liquid), with the result that a uniform delivery of a fixed volume is ensured. The apparatus is very valuable in positions where regularity of flow or measuring of discharge is desired.

HERBERT HEAP, Esq., Deputy Borough Engineer, Grimsby :—

> "The Sewage Lift Purchased by this Authority from you six years ago has given every satisfaction. During the whole time the apparatus has been at work we have not expended any money for attendance or repair."

Sewage Disposal, etc.

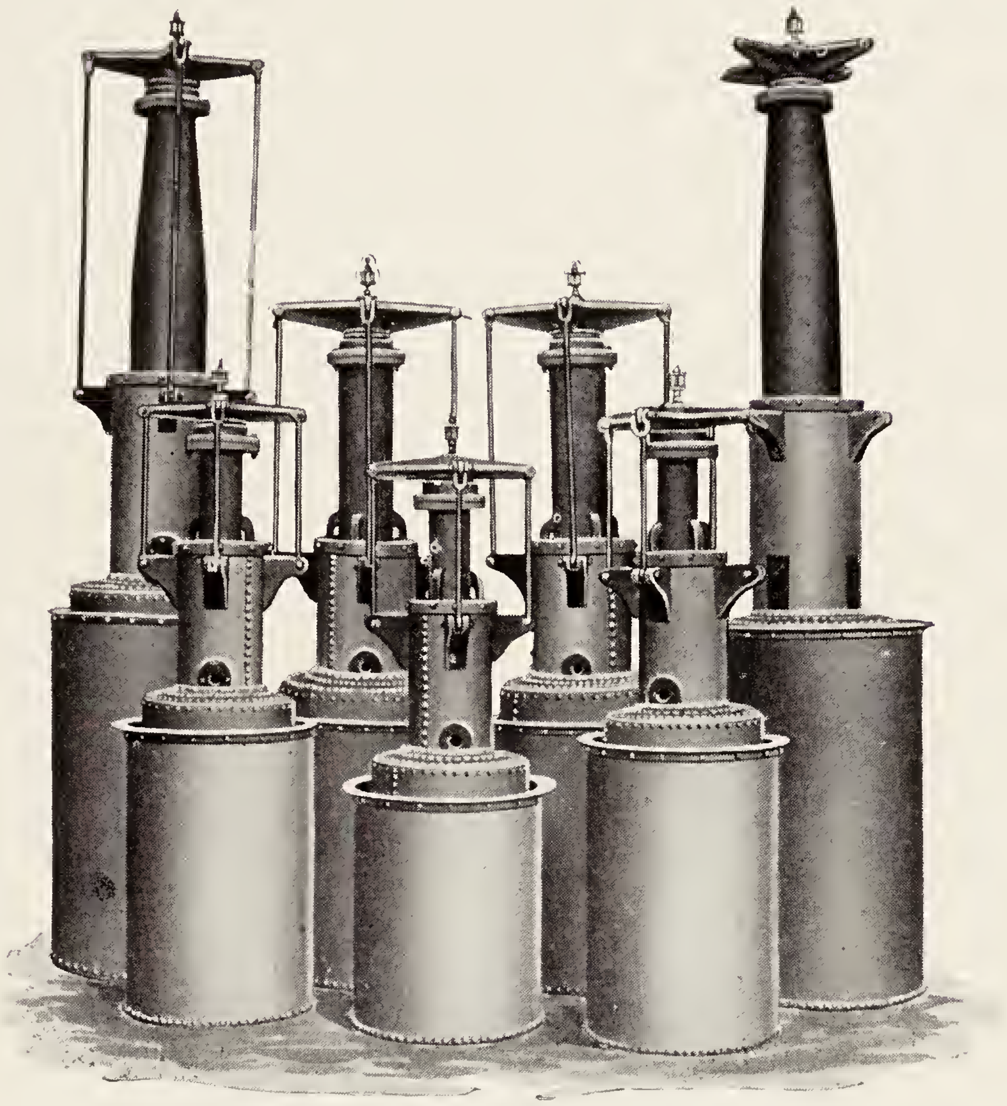
ADAMS' PATENT CRESSET REVOLVING DISTRIBUTOR.



DESCRIPTION OF DISTRIBUTOR.

IT will be seen that sewage passes up the duck-foot bend, through the slots shewn in central cast-iron column, and thus to the arms of the Distributor, and that the head of liquid upon the arms is the same as at the source of supply—*i.e.*, there is no loss of head. The discharge under the maximum is three times greater than that under the minimum —the volume delivered may vary thus in stock pattern from one to three; at the same time the discharge per yard over total surface is uniform, a matter of considerable importance. The coupling is a simple air-lock trap caused by the locking in of a body of air between the

Adams' Patent Cresset Revolving Distributor.

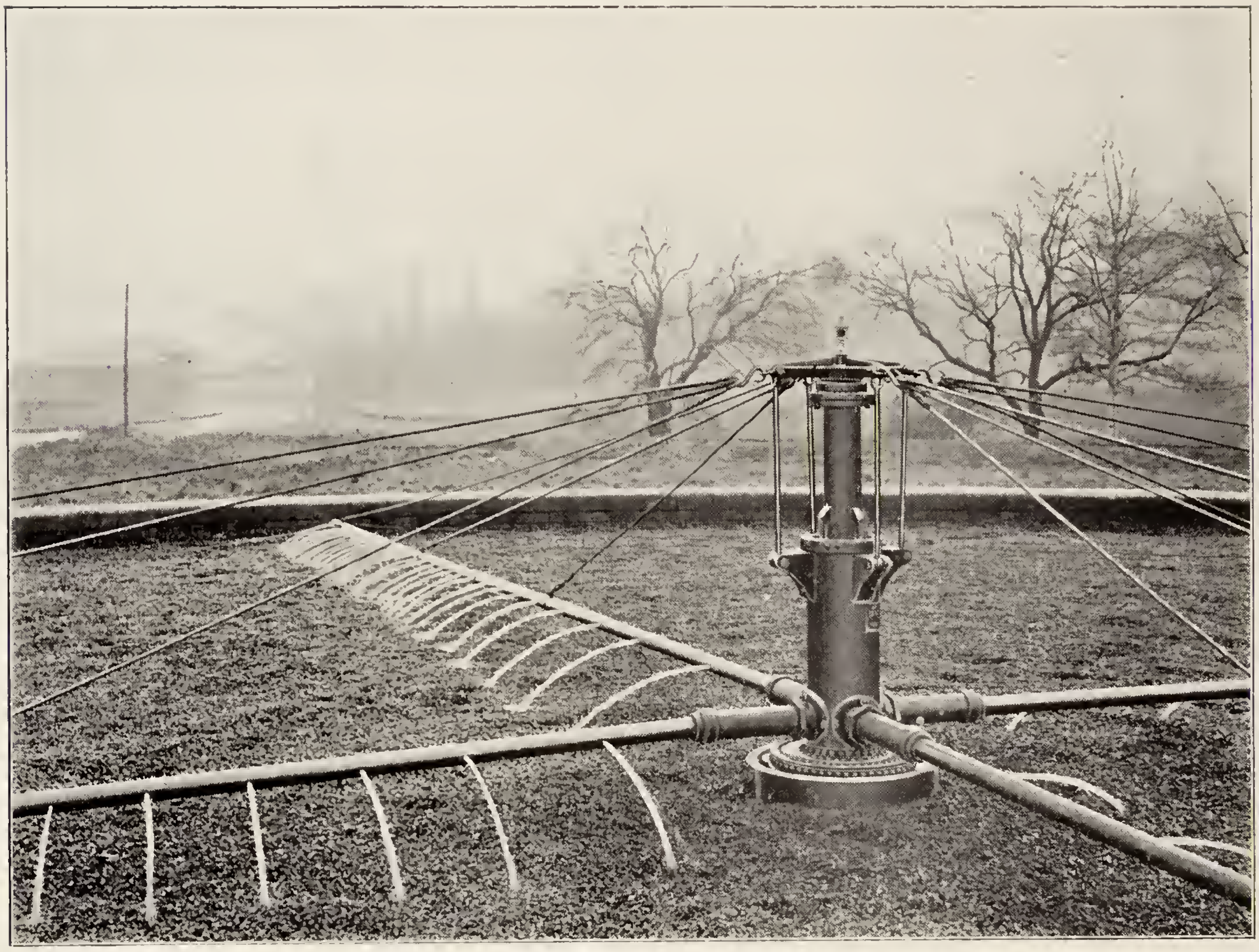


A Group of Distributors in course of construction.

outer and inner annular spaces of the lower tank and the body of the Distributor which is suspended over and dips into the water seal below. The air-lock thus created allows the Distributor to revolve practically without friction; at the same time it entirely prevents the exit of liquid through the coupling. The Distributor body is hung upon a cross head and revolves around the central column upon ball bearings suitably carried—the whole is surmounted by a lubricator. The ball bearings and races may be removed and replaced without dismantling the Distributor. The apparatus may be fitted with either open troughs or perforated pipe arms, the latter ensure the more uniform distribution of liquid.

Sewage Disposal, etc.

REVOLVING SPRAY DISTRIBUTORS.



Distributor erected at Apperley Bridge for the Bradford Corporation.
J. GARFIELD, Esq., Engineer, City Sewage Disposal Works.

These Distributors will work with a difference of from 9 in. upwards (sewer invert to filter surface).

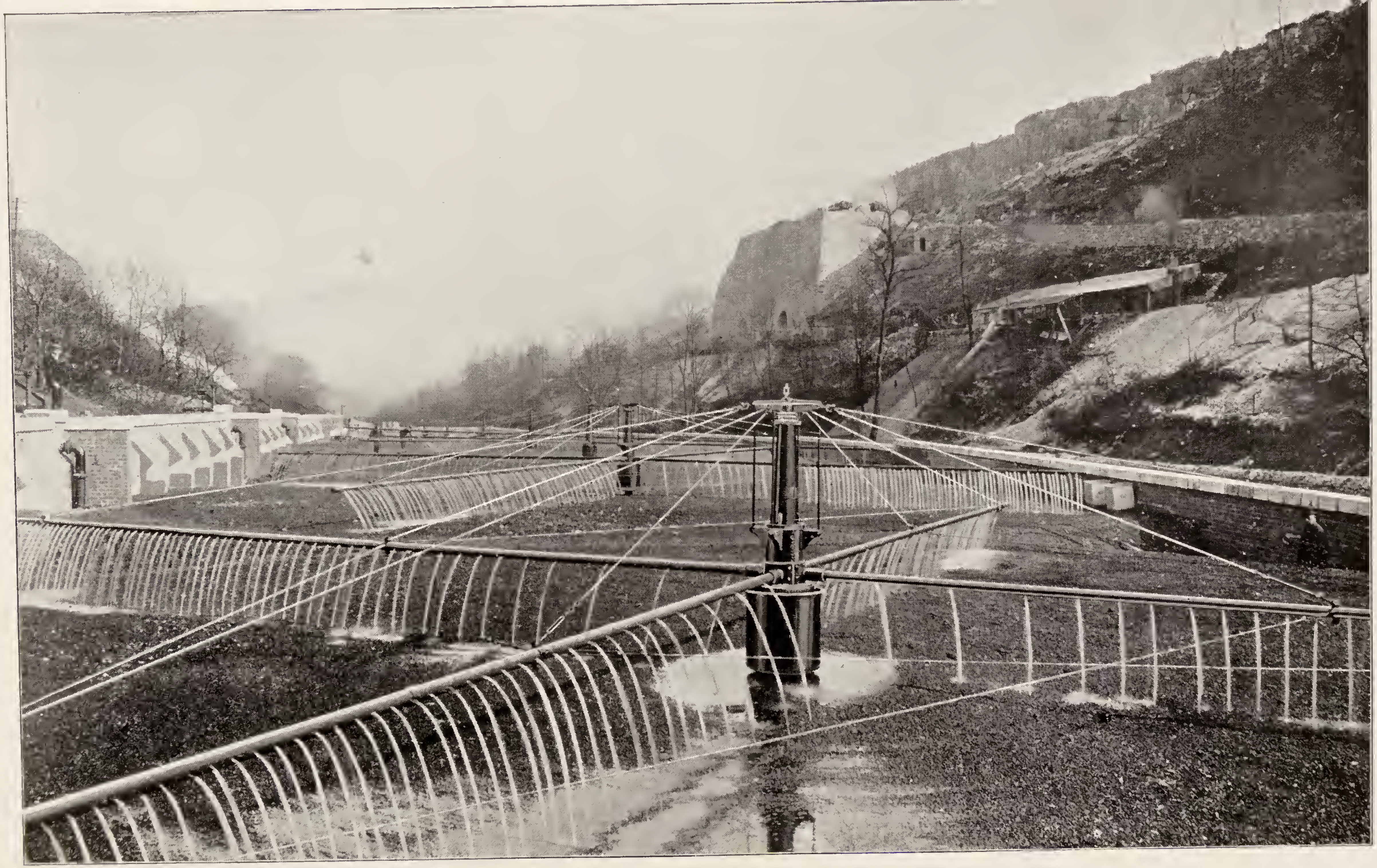
G. H. TAIT, Esq., M.I.C.E., Dartford :—

"I have used your Automatic Syphons in many works (public and private) and have in all cases found them to be eminently satisfactory."

A. G. MCBEATH, Esq., Engineer, U.D.C., Sale :—

(Of a 20″ dia.) :—"During the years it has been in operation it has given every satisfaction. It works to-day in the same efficient manner as when first started."

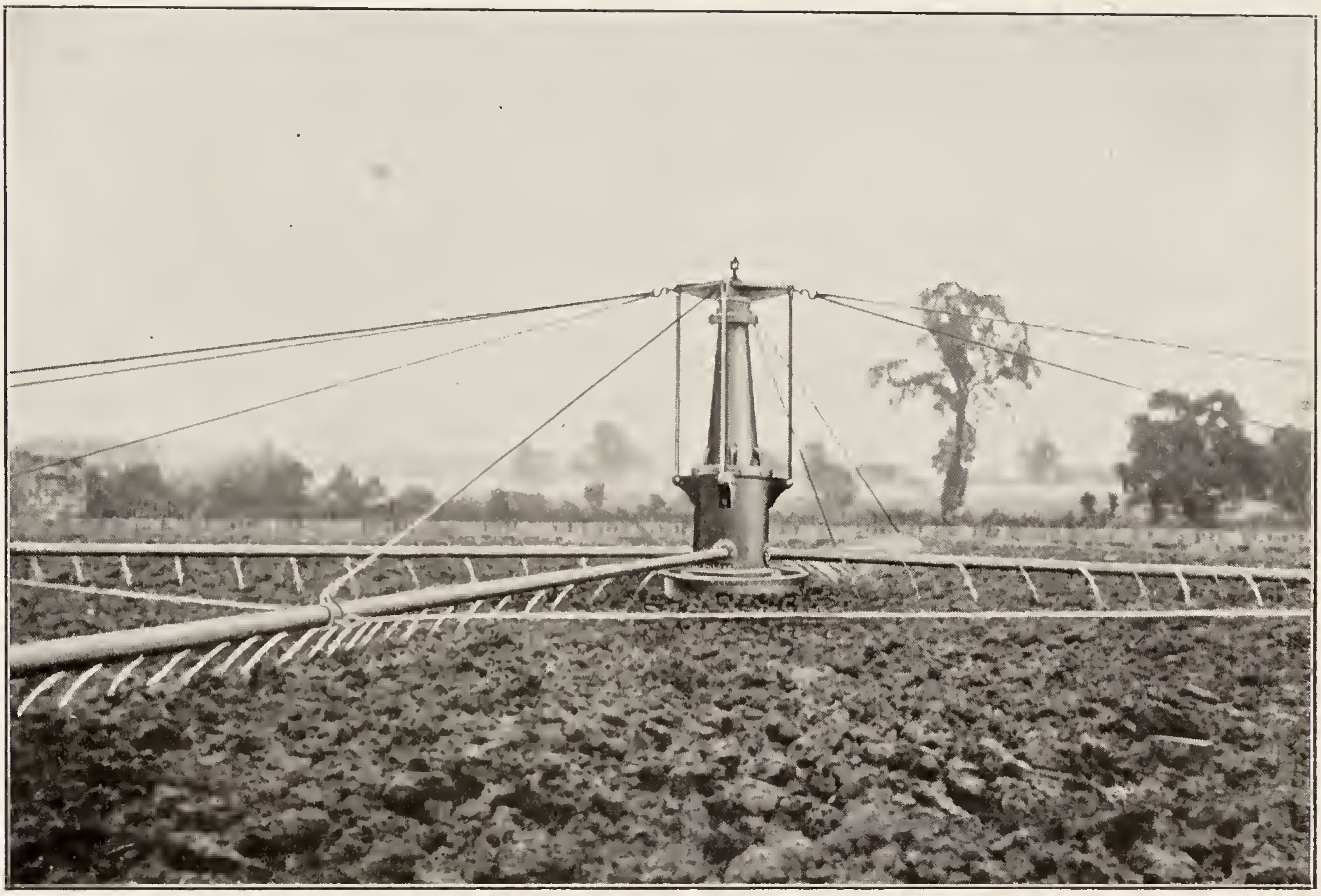
Sewage Disposal, etc.



SEVEN ADAMS' PATENT CRESSET AIR-LOCK DISTRIBUTORS at Buxton, erected for HEDLEY GRIEVES, Esq., Surveyor.
(It will be seen that the beds are incomplete).
Eight similar Distributors are now being erected for the Derby Corporation, under Messrs. JAMES MANSERGH & SON, Engineers, Westminster, S.W.

Sewage Disposal, etc.

REVOLVING SPRAY DISTRIBUTORS.



Distributor, Waltham Abbey.

W. TURNER STREATHER, Esq., Surveyor, Waltham Abbey, says :—

> "The Sprinkler supplied by you six months ago works beautifully—I am more than satisfied."

RE SEWAGE LIFT.

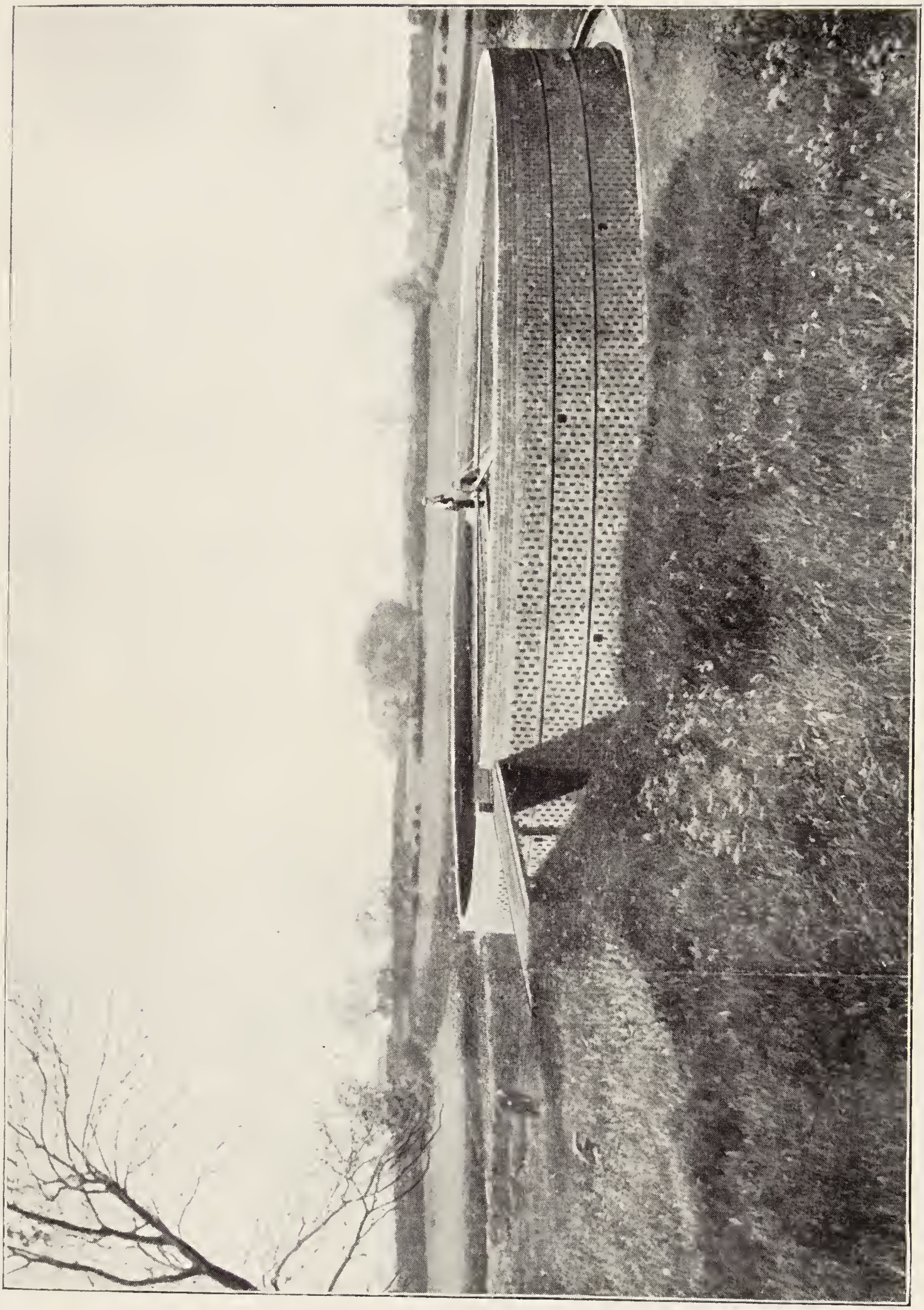
W. N. COLAM, Esq., M.I.C.E., Edinburgh and London :—

> "The apparatus works to our entire satisfaction. As an automatic pump it appears to me to be working as nearly as possible on the principle of work done at no cost. Its great charm is its simplicity and absence of moving parts."

HERBERT J. GARROD, Esq., Newmarket :—

> "The Sewage Lift which you put down for Colonel McCalmont about two years ago has proved entirely successful."

Sewage Disposal, etc.



View of the Filter as installed at the York City Sewage Disposal Works by ALFRED CREER, Esq., City Engineer, York.

Sewage Disposal, etc.

REVOLVING SPRAY DISTRIBUTORS.

View shewing One of the Three Distributors erected at the Sewage Purification Works, Salisbury, after trial of other systems.

Distributor erected at the Birmingham City Sewage Disposal Works.
JOHN WATSON, Esq., Engineer.

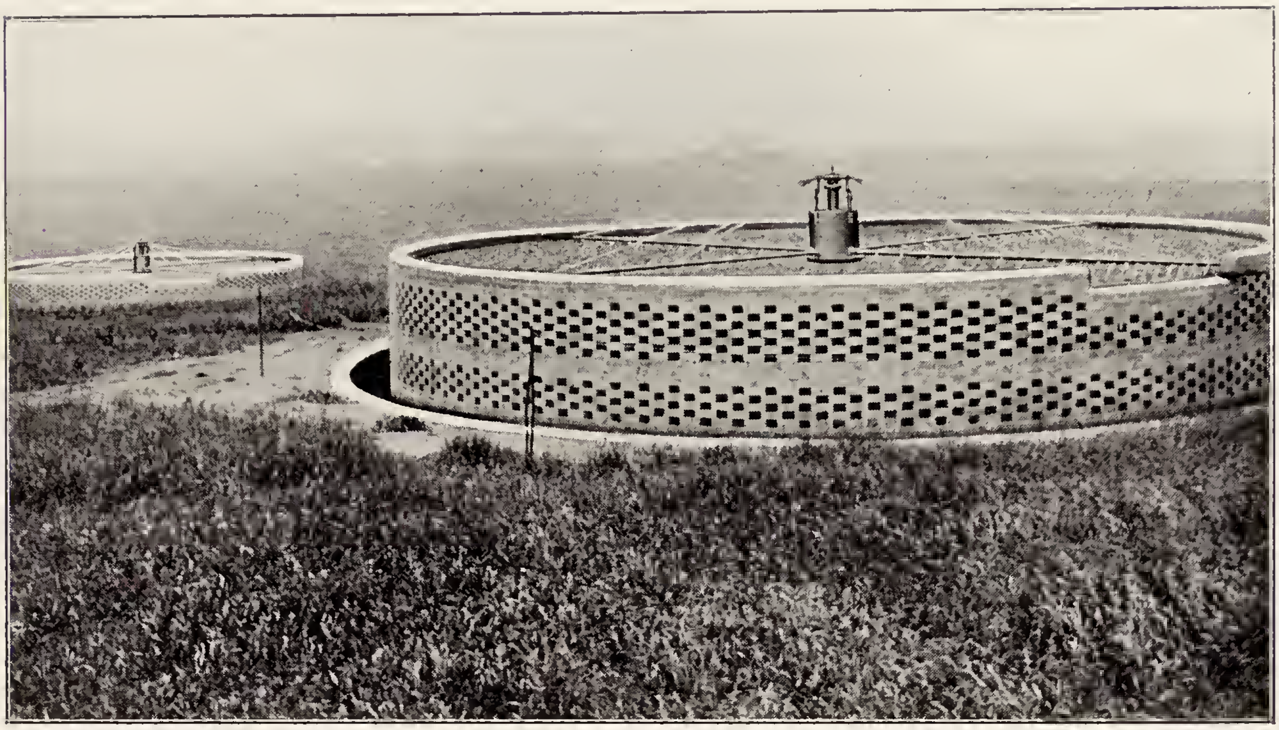
ALFRED BOOTHAMS, Esq., The City Engineer, writes:—

> "The Three Distributors erected by you are working in a very satisfactory manner. The two first filters are giving good results, and the one last erected appears to be progressing as satisfactorily as the earlier ones."

The Helorf Lever Disc and Sluice Valves may be manipulated by a child.

Sewage Disposal, etc.

REVOLVING SPRAY DISTRIBUTORS.



Primary and Secondary Filters at Walsall.

R. H. MIDDLETON, Esq., Borough Engineer, writes :—

"I am not in the habit of giving testimonials, but if you refer anyone to me I shall always be pleased to testify as to the working of your Revolving Distributors."

RE ADAMS' FLUSHING SYPHONS.

THOMAS G. GOLDER, Esq., Borough Engineer, Deal :—

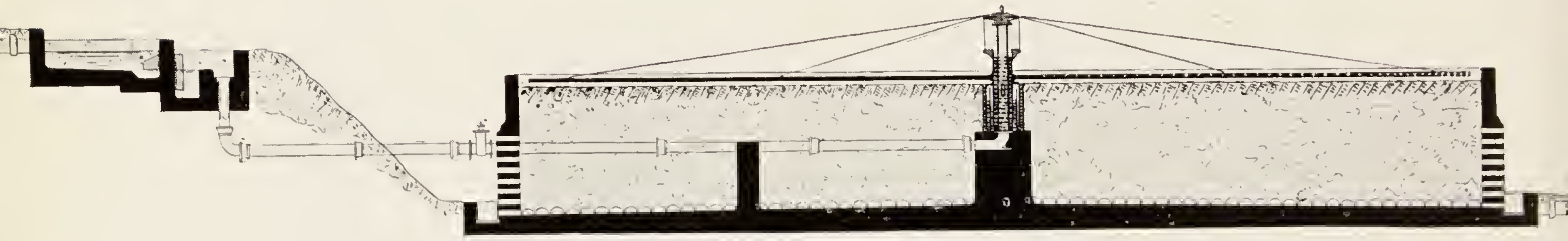
"The Syphons are working *most satisfactorily* on Sewers from 6 in. to 24 in. diameter. *They are the only Syphons I have in use which do not get out of order.*"

URBAN SMITH, Esq., C.E., Parliament Street, S.W. :—

"I am not in the habit of giving testimonials in matters of this sort, but I have nothing but good to say with regard to your Syphons. I used to regard them as somewhat expensive, but having tried cheaper patterns, I have come back again to yours, which have always worked—as far as my experience goes—very satisfactorily."

Sewage Disposal, etc.

ADAMS' PATENT CRESSET DISTRIBUTOR.



WHERE the flow is very irregular it may fall at night to such an extent that the Distributor will not revolve. In such a case it is desirable to store the sewage in a Dosing Tank, from which it discharges in bulk to the Distributor. The drawing above shews an adaptation of our self-acting Syphon, which is used for this purpose. It discharges continuously so long as the flow of sewage is sufficient, and when insufficient it ceases to discharge and the Distributor stops until the tank, having become full again, comes into operation. This apparatus will work in a depth of from 6-in. upwards.

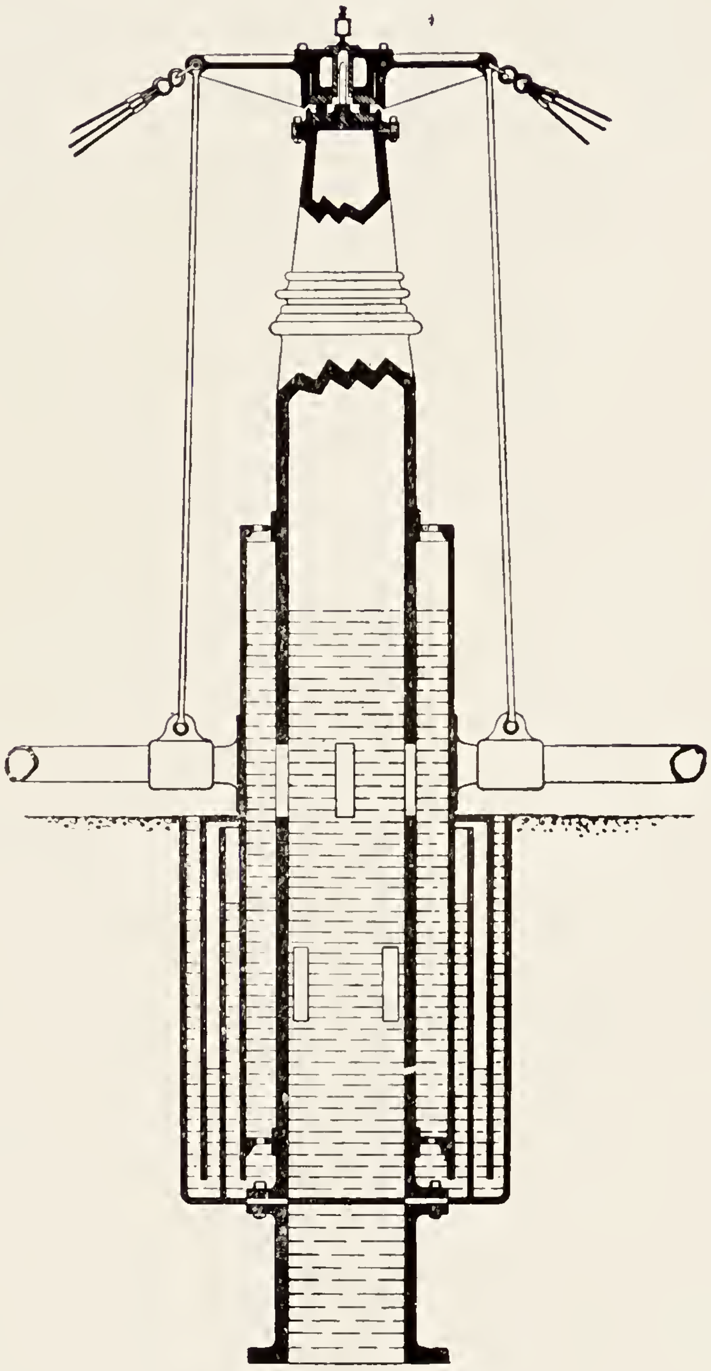
It may also be arranged to discharge in sequence, alternately or otherwise, to a plurality of filters.

URBAN SMITH, Esq., C.E., Parliament Street, S.W. :—

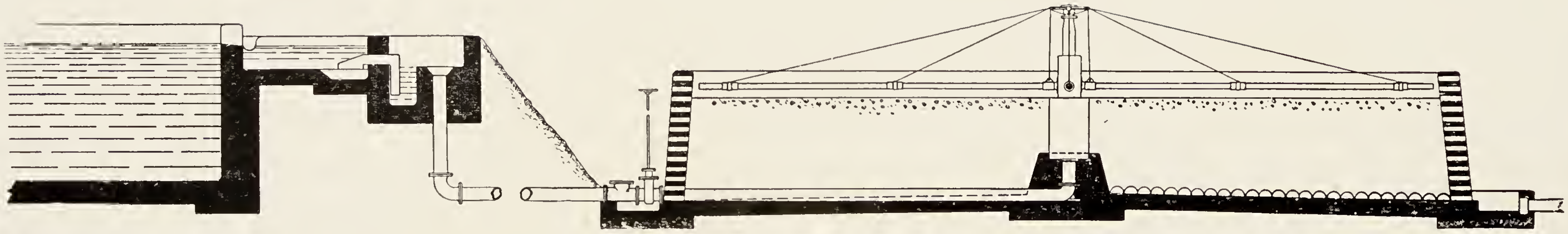
> "I am not in the habit of giving Testimonials in matters of this sort, but I have nothing but good to say with regard to your Syphons. I used to regard them as somewhat expensive, but having tried cheaper patterns, I have come back again to yours, which have always worked—as far as my experience goes—very satisfactorily."

Sewage Disposal, etc.

ADAMS' PATENT "CRESSET" DISTRIBUTOR.



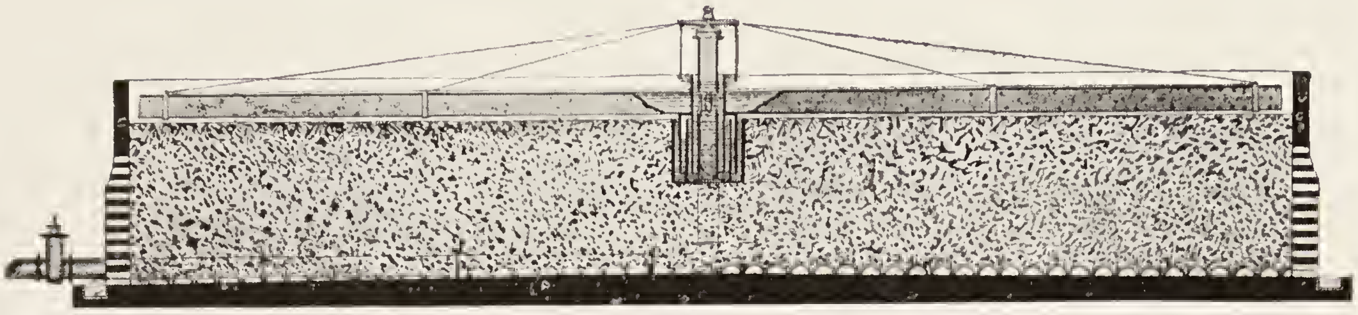
THE section above shews the special features—the Air-Lock Frictionless Coupling described (page 82)—and the Cross Head from which the ball bearings and races may be removed for renewal, etc., without dismantling the Distributor. The apparatus will revolve with a head of 4-in. upwards—to this must be added the clearance between distributing arms and the surface of filter—which should not be less than 6-in.



TYPICAL Drawing shewing ADAMS' PATENT "CRESSET" DISTRIBUTOR, with Air-Lock Frictionless Coupling, by means of which an equal distribution over the entire area is obtained with volumes varying from one to three—*i.e.*, maximum and minimum. The Dosing Tank shewn is necessary only where the flow falls—as at night—to such an extent that the Distributor will not revolve. This may be expected to occur with small installations only; for large, the Fixed Volume Weir shewn upon page 81 is very useful.

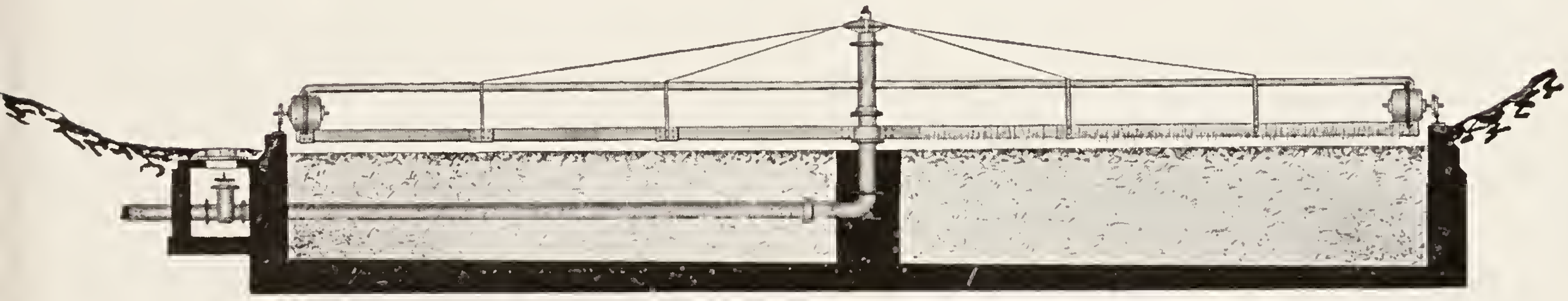
Sewage Disposal, etc.

ADAMS' PATENT CRESSET DISTRIBUTOR.



THE drawing above shews the Distributor already described, but fitted with open trough arms.

ADAMS' PATENT PADDLE DISTRIBUTOR.

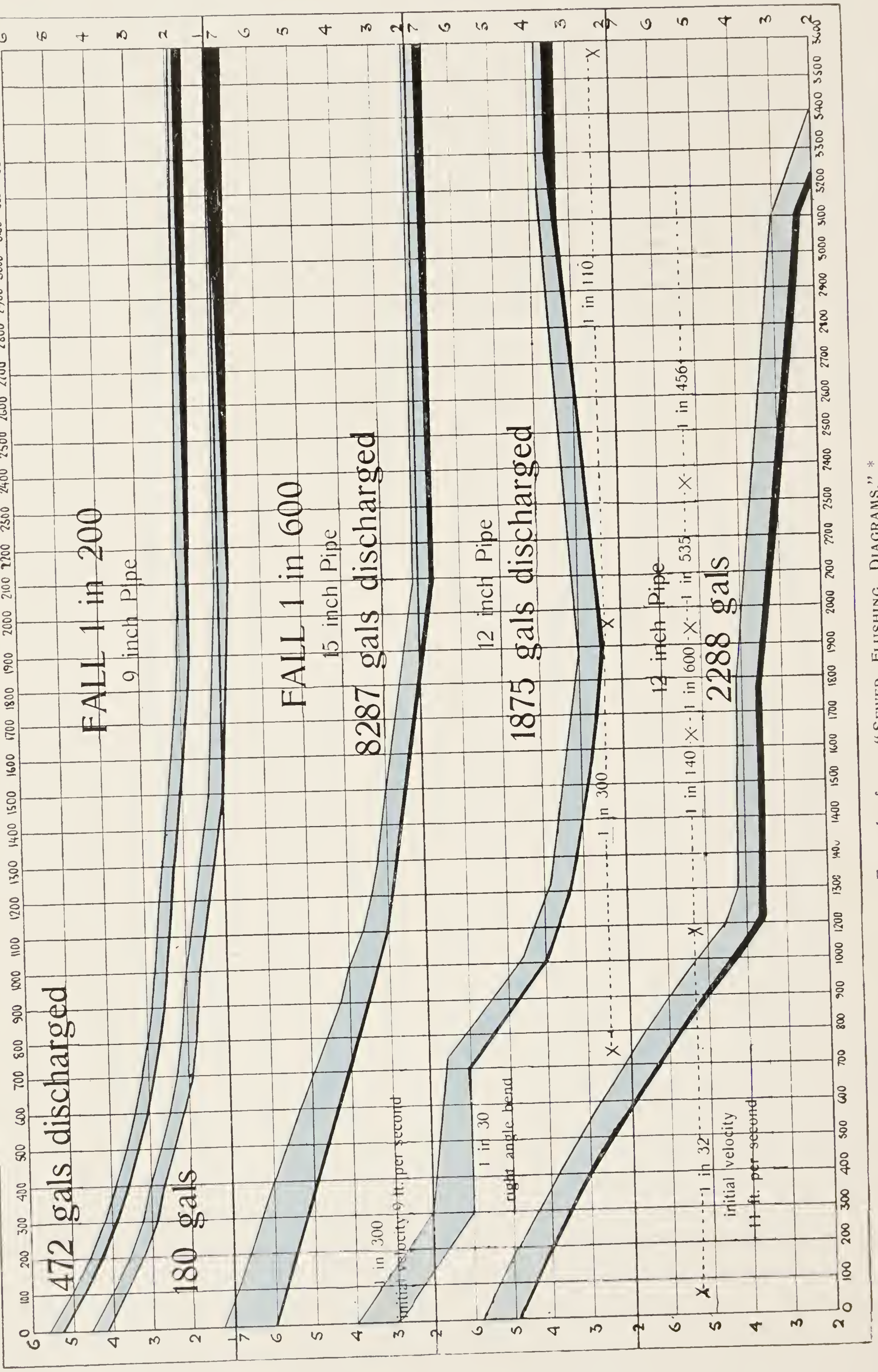


IN this Distributor the sewage itself is used as a motive power to cause the required revolutions. The supply passes up the central column to distributing pipes on either side, thence through the paddle boxes to the open trough, from which it is delivered to the filter. Small driving wheels are attached to the paddles—these travel upon the rail around filter wall.

S. J. L. VINCENT, Esq., Town Hall, Newbury :—

"I have your Cresset Disc Valves in use as outlets for Bacteria Beds; they are certainly the best I have seen."

Sewer Flushing, etc.



Example from "Sewer Flushing Diagrams."*

Vertical Scale - Velocity in feet per second. Horizontal Scale - Length of Sewer Flushed.

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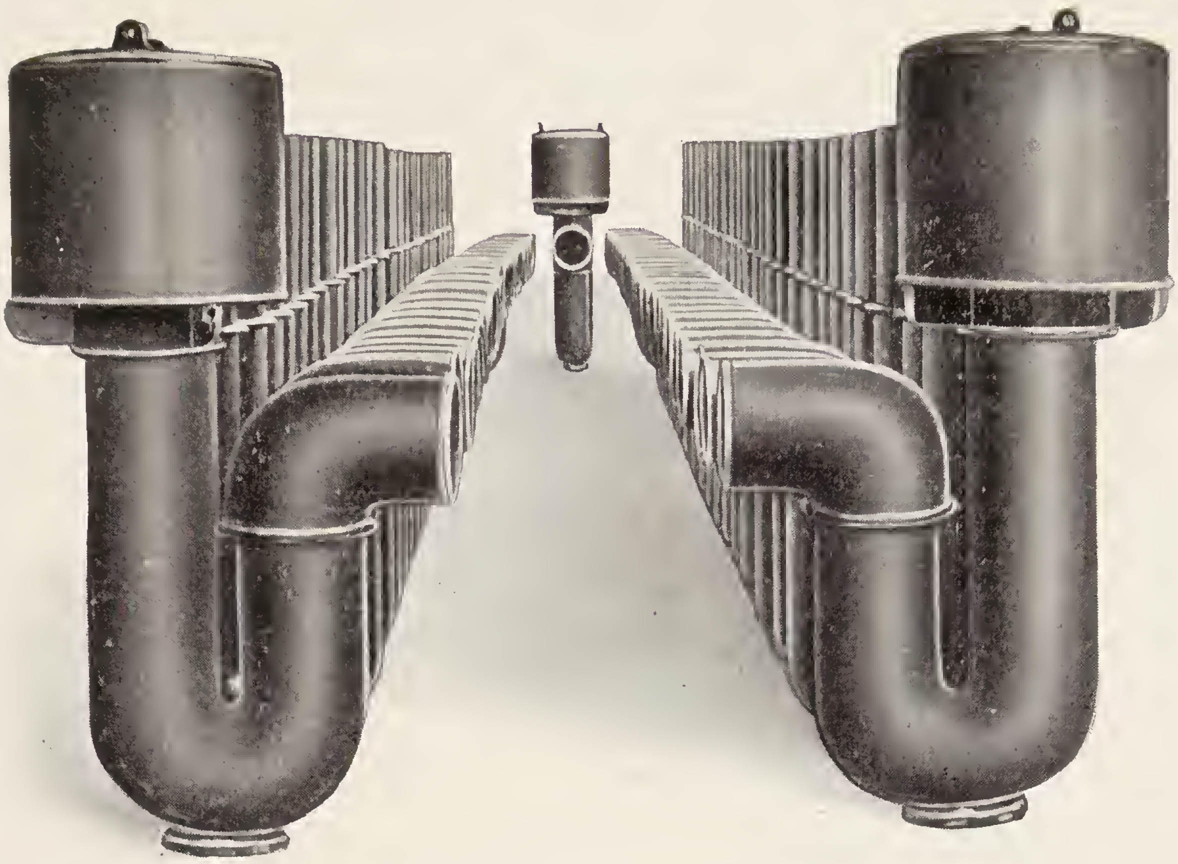
* "Sewer Flushing Diagrams." by S. H. Adams, A.M.I.C.E., York, etc. 7s. 6d. nett.

Sewer Flushing, etc.



View of Sixty 10-in. Diameter Syphons.

ADAMS-HYDRAULICS, LTD.,

Are Makers to H.M. OFFICE OF WORKS, H.M. WAR OFFICE, H.M. ADMIRALITY, The Home, Foreign and Colonial Offices and Governments.

An Engineer writes:

> "Your Syphons are the only ones I know of which will certainly act with a mere dropping feed."

OUR SPECIALITY for upwards of eighteen years has been the manufacture of Flushing Apparatus.

RETURNS shew (from an official enquiry made) some 64 % of our Syphons in use, as against 36 % of all other makes combined.

TYPES. Our Syphons are made for every variety of work, drawing from 12-in. upwards, and from 3-in. to 36-in. diameter of outgo.

Velocity of discharge in stock sizes is believed to be about 20 % quicker than any other make of Syphon. The discharge, however, will vary according to local conditions, depth drawn, etc.

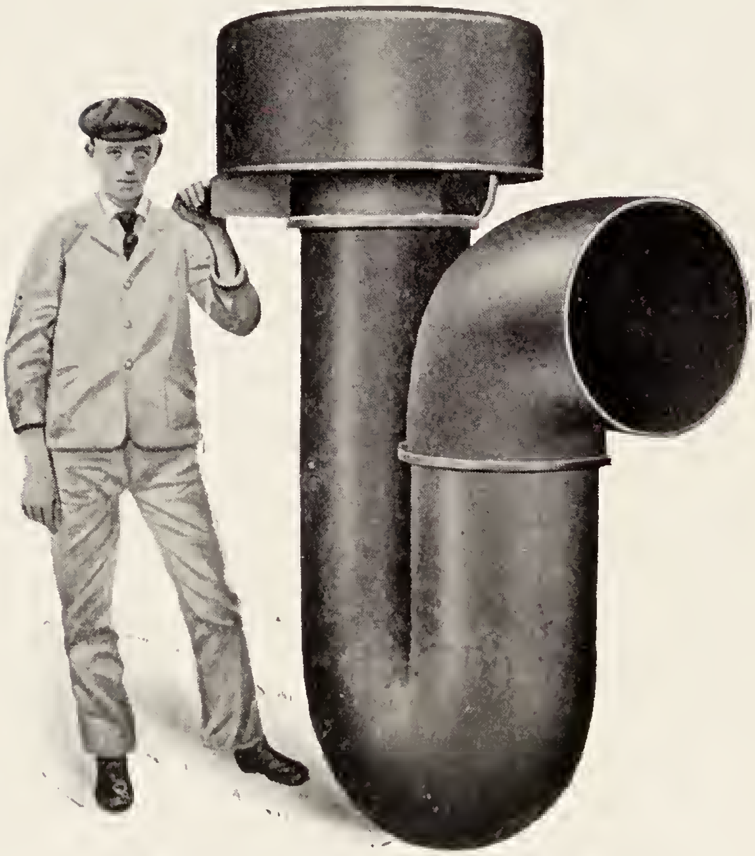
Vent or side pipes are employed where their use is necessary to obtain the desired result.

See Reduced Prices and "New Standard" Designs.

NOTE.—The Makers are responsible for manufacture. If faulty goods are sent out, they will be rectified free of charge; but in no case will claims for damages or costs be entertained, from whatever cause arising.

On Sewer Flushing.

THE importance of systematic and automatic sewer flushing cannot be over estimated—where automatically flushed sewers may be laid at a grade otherwise impossible, the production of sewer gases in old sewers is also prevented.



A Large Flushing Syphon. Fig. 75.

Any number of syphons may be placed in one tank and arranged to discharge alternately or in any desired sequence.

It is apparent that in many cases the first cost of the syphons has prohibited their use — for this reason we are now making a new Standard Syphon of simple construction at a less cost; in addition to which, the prices of our Drop-by-Drop Syphons are reduced,—and further, a new Standard Syphon is now supplied in earthenware.

THOS. R. SMITH, Esq., U.D.C., Kettering—

(After exhaustive trials of other makers):—"The whole of the 44 Automatic Syphons you supplied to this Council last year are working satisfactorily. Enclosed I send you an order for two more:"

G. H. TAIT, Esq., M.I.C.E., Dartford:—

"I have used your Automatic Syphons in many works (public and private) and have in all cases found them to be eminently satisfactory."

URBAN SMITH, Esq., C.E., Westminster:—

"Have nothing but good to say in reference to your Syphons. I used to regard them as somewhat expensive, but having tried cheaper patterns, have come back to yours, which have always worked.

A. J. HIBBERT, Esq., Chairman Sanitary Committee, Chorley:—

"The Syphons are working splendidly—the best we have ever had."

The insertion of the name and catalogue figure in a specification will ensure the purchase of the articles desired.

☞ NOTE.—When ordering give height of water in tank from invert of sewer to be flushed to water level.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

Syphon Prices for Types O and C, stock depths.

Syphon No.	Usually Flushes	Fig. 75. Stock Depth.	Extra per ft.
0	4-in. sewer	£3 15 6	5/-
1	6-in. ,,	4 7 6	6/-
2	9-in. ,,	6 0 0	7/6
3	12-in. ,,	8 0 0	9/-
3a	12-in. ,,	9 10 0	12/-
4	15-in. ,,	11 5 0	15/-
5	18-in. ,,	13 5 0	18/-
6	21-in. etc.	15 15 0	20/-
7	24-in. ,,	17 10 0	24/-
8	30-in. ,,	19 0 0	45/-

Prices of New Standard, see on.

STOCK SIZES Nos. 0, 1, 2 and 3, discharge 3-ft. of water; other sizes, 2-ft. 6-in.

SPECIALS are made to discharge any depth, and of any diameter from 3-in. for house drains, to 3-ft. 6-in. diameter or more for brick sewers, &c. In ordering Specials, give measurement from invert of sewer to be flushed to top water level in tank.

Strong Ventilated Manhole Cover, (Fig. 30, page 129)
20-in. clear opening 40/-

Dirt Box 7/6

Flush Tank Counters, for automatically recording discharges of tank ... . 1,000 discharges, 25/-; 10,000 discharges, 30/-

Step Irons ... ... Unbreakable Black, 1/-; Galvanized, 1/3

Trapped Supply and Stout Brass Tap 8/6

Sundry Fittings, see page 109.

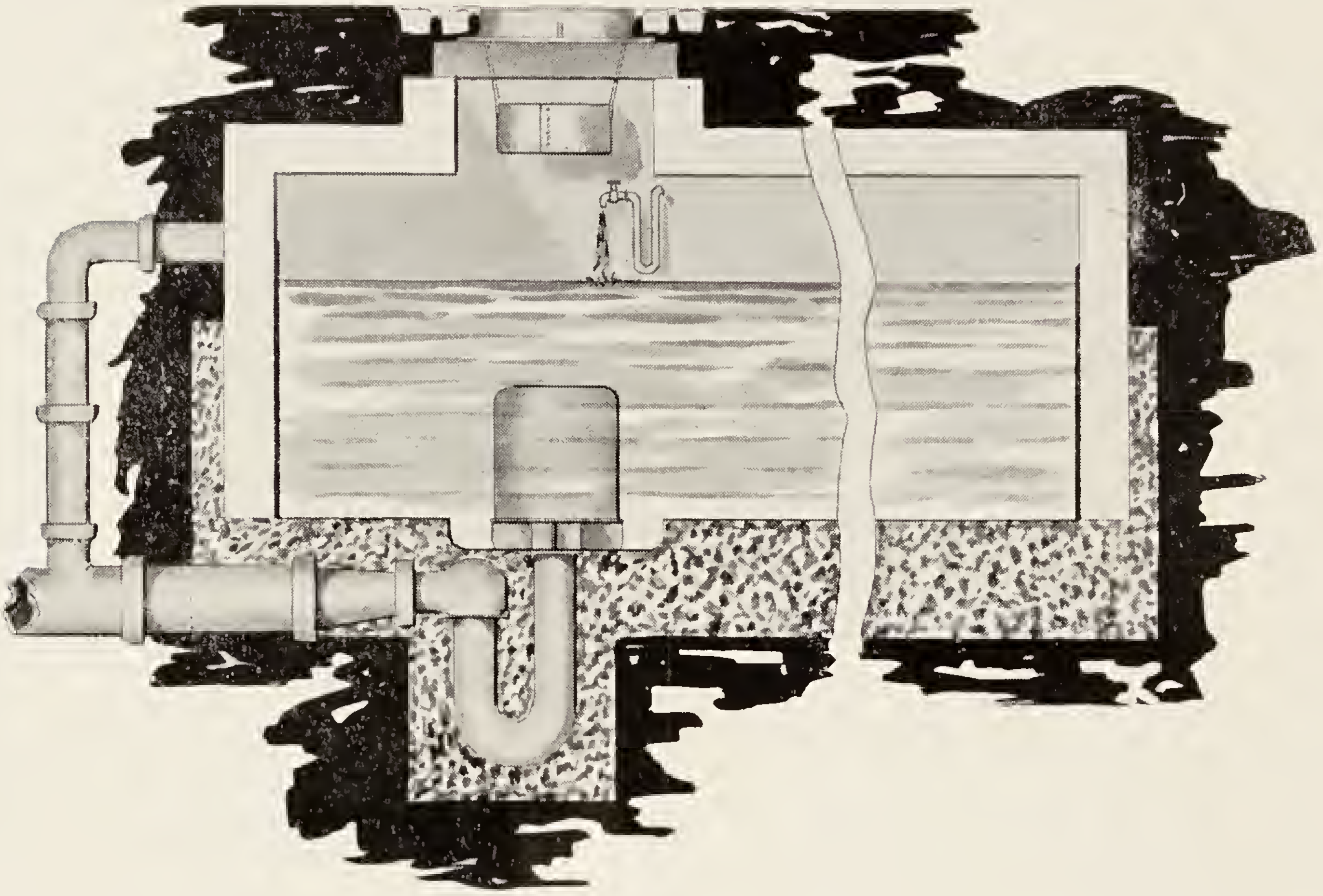
Note.—Shallow Syphons will draw 1 ft. and upwards.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

Adams' Patent Syphon with Swivel Outlet.

Type O.



Syphon Fig. 75.

THE drawing shews Adams' Patent latest improved (Fig. 75) Sewer Flushing Syphon. This Syphon has been improved from time to time and is to-day the most perrect flushing apparatus. It will work with a drop feed. Special attention is drawn to the Swivel Outlet which may be turned in the direction of the sewer. Thousands of these Syphons are in use.

PRICES.

Size No.	To Flush Sewer	Syphon	Depth of water drawn	Manhole Cover and Dirt Box.	
0	4 in.	£3 15 6	3 ft. 0 in.	£2 0 0	18 ins.
1	6 in.	4 7 6	3 ft. 0 in.	2 0 0	
2	9 in.	6 0 0	3 ft. 0 in.	2 7 6	
3	12 in.	8 0 0	3 ft. 0 in.	2 7 6	
3a	15 in. to 18 in.	9 10 0	2 ft. 6 in.	2 7 6	
4	18 in. to 21 in.	11 5 0	2 ft. 6 in.	2 7 6	
5	21 in. upwards	13 5 0	2 ft. 6 in.	2 7 6	

See page 95 for other sizes, etc.

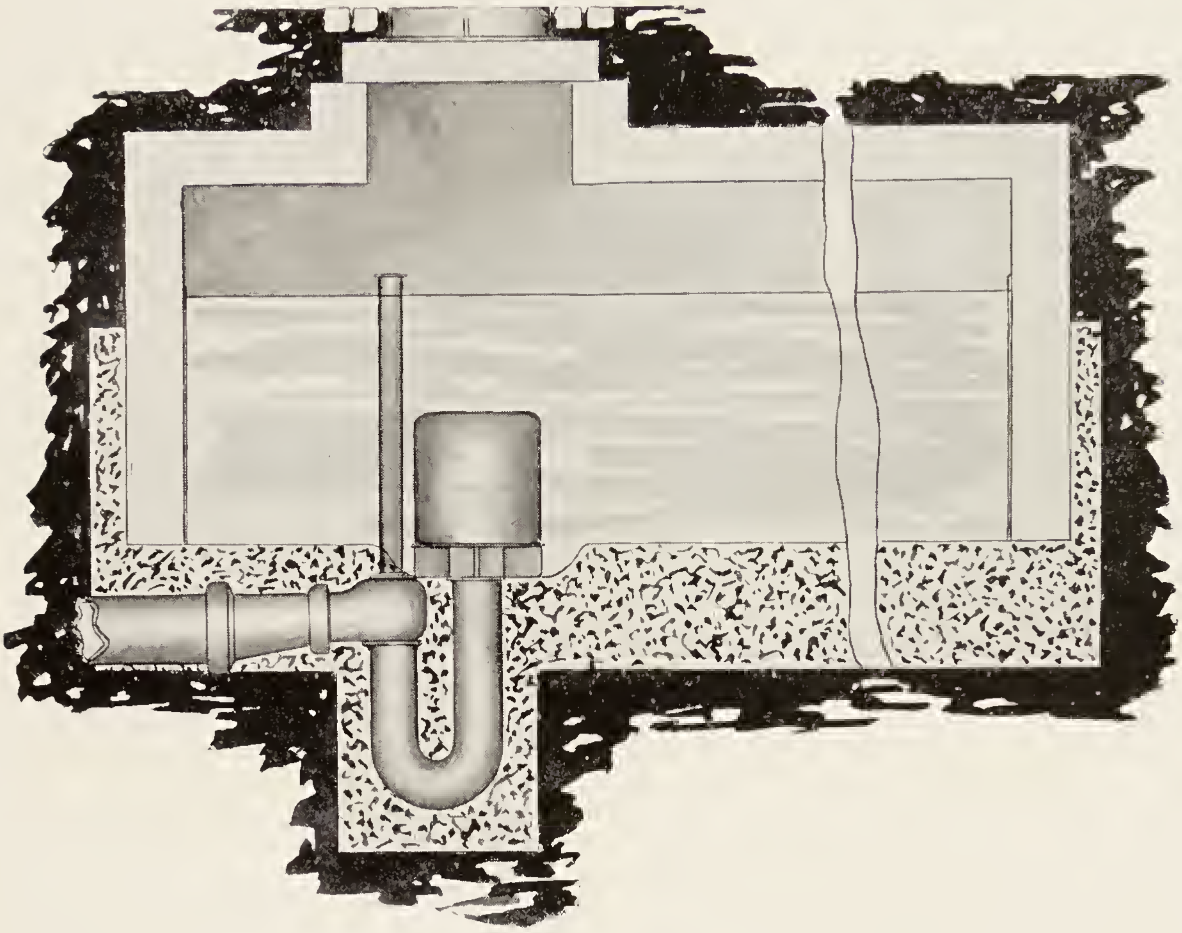
An official return shews that some 64 per cent of all Syphons used are ADAMS'.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

Adams' Patent Syphon with Vent and Swivel Outlet.

Type A.



Syphon Fig. 75a.

THIS drawing shews our new Patent Sewer Flushing Syphon, with Swivel Outlet, with special combined vent, inspection, and overflow pipe. This Fitting saves the cost of a separate manhole or other vent or overflow.

The overflow pipe may be lifted entirely out when desired for purposes of sewer inspection, etc.

When ordering give measurement from top water line to sewer invert.

PRICES.

Size No.	To Flush Sewers	Syphon with Swivel Oultet and Vent	As last but cast taper connection Syphon to Sewer	Manhole Cover and Dirt box
0	4 in.	£4 10 0	£5 0 0	2 0 0
1	6 in.	5 0 0	5 15 6	2 0 0
2	9 in.	6 12 6	7 15 0	2 7 6
3	12 in.	9 10 0	10 0 0	2 7 6
3a	15 in. to 18 in.	12 17 6	13 17 6	2 7 6
4	18 in. to 21 in.	18 10 0	20 0 0	2 7 6
5	21 in. upwards	24 0 0	27 10 0	2 7 6

Stock sizes discharge 3-ft. of water in Nos. 0, 1, 2 and 3, other sizes, 2-ft. 6-in.

20-in. Manhole Cover, (Fig. 30, page 129), 40/- ; Dirt Box, 7/6.

Step-irons, malleable cast, galvanized, 1/3 ; black, 1/-.

THOS. G. GOLDER, Esq., Borough Engineer, Deal:—

> "The Syphons are working most satisfactorily on sewers from 6″ to 24″ dia. They are the only Syphons I have in use which do not get out of order."

Prices for larger sizes and specials of every type upon application,

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

Shallow Syphon.

Type C.

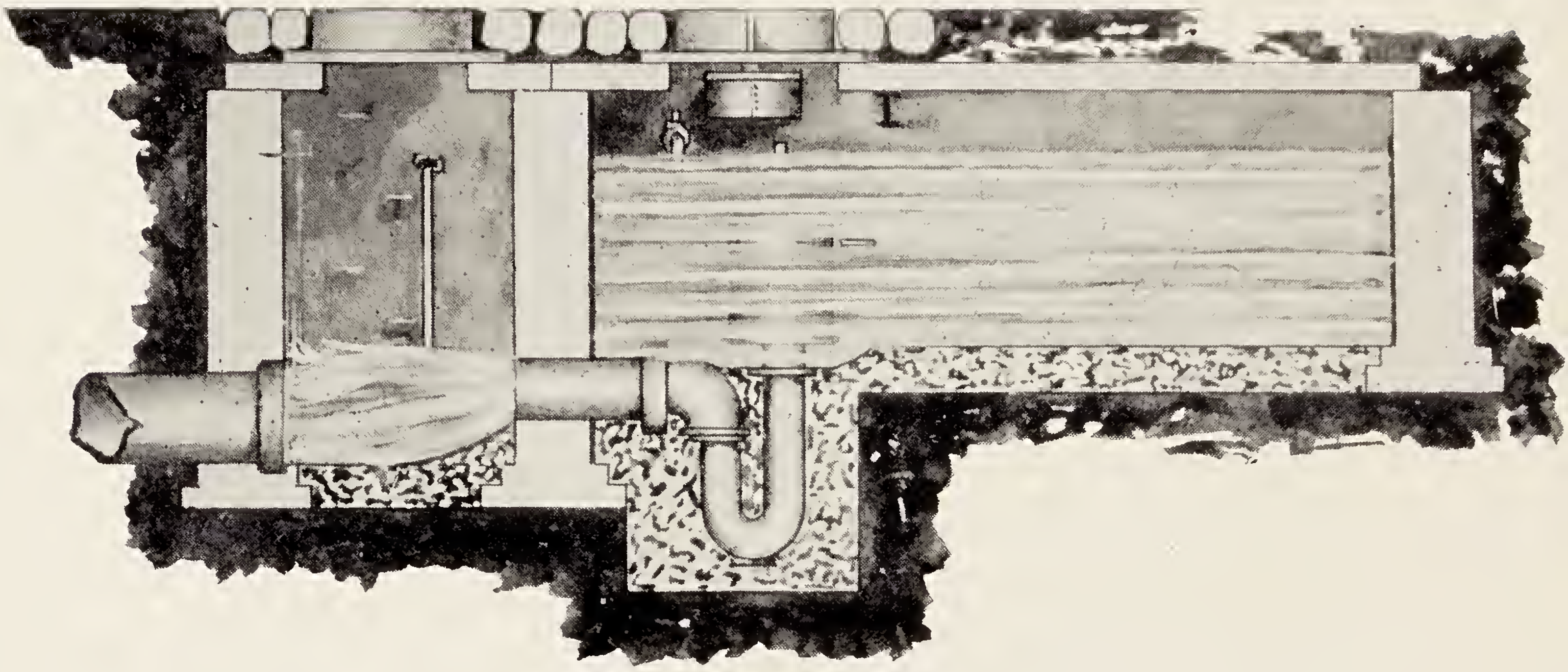


Fig. 75b.—Prices as on page 95.

THE drawing shews a shallow chamber, with covering of flagging, supported upon wrought-iron joists. One cover gives access to the flushing chamber, the latter discharges to a manhole in which two or more sewers terminate; the flush is directed to one or other by means of the disc valves shewn. Where desired the manhole may be dispensed with, and the sewer connected direct to syphon mouth.

In these shallow chambers, the head of water on the syphon being small, the velocity of discharge is considerably less than with stock depths. For this reason it is frequently desirable to use a syphon of larger diameter.

These syphons discharge from 1 foot of water upwards.

MANHOLE COVER (Fig. 30, page 129)	20-in., 40/-
DIRT BOX	7/6, 8/6
STEP IRONS	Unbreakable Black, 1/-; Galvanized, 1/3
WROUGHT JOISTS	4-in. × 3-in. × 5-ft. 6-in. 11/- each
ADAMS' PATENT 'HELORF' DISC VALVE (see page 112)	6-in., 21/6; 9-in., 30/-; 12-in., 41/-; 15-in., 48/-
TRAPPED SUPPLY TAP (as on page 95)	8/6

THOS. R. SMITH, Esq., U.D.C., Kettering—

(After exhaustive trials of other makers);—"The whole of the 44 Automatic Syphons you supplied to this Council last year are working satisfactorily. Enclosed I send you an order for two more."

Returns shew that some 64 per cent. of all Syphons in use are ADAMS'.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

Adams' Patent Swivel Outlet, extra long, with Chain and Wall Plate.

Type E.

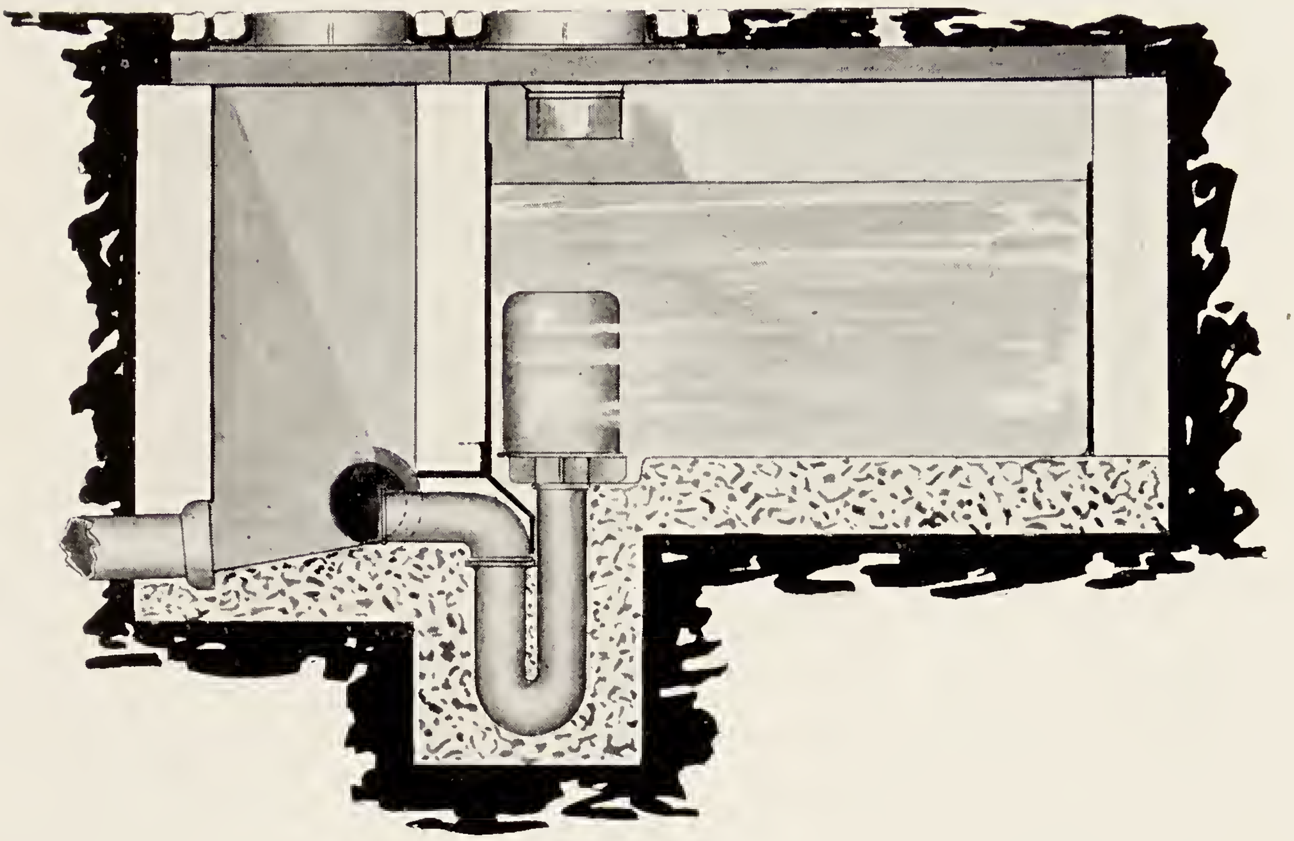


Fig. 75c. Drop by Drop Syphon.

HERE both Flushing and Inspection Chambers are provided. The Syphon is fitted with Long Swivel Outgo, Fig. 82a, page 109, which is swung by a hand chain into the mouth of the sewer to be flushed; one tank will thus flush two or more sewers. Disc Valves may be used on the sewers if wished instead of swivel outgo.

Division Plate. A special cast iron plate is made to support wall over syphon outlet.

PRICES REDUCED.

Stock sizes discharge 3-ft. of water in Nos. 0, 1, 2 and 3, other sizes, 2-ft. 6-in.

Size No.	To Flush Sewer	Syphon with Long Swivel and Chain	Depth Discharged	Cast Iron Wall Box and Guide
0	4 in.	£4 3 0	3 ft. 0 in.	1 10 0
1	6 in.	4 17 6	3 ft. 0 in.	1 15 0
2	9 in.	6 10 0	3 ft. 0 in.	2 0 0
3	12 in.	8 15 0	3 ft. 0 in.	2 5 0
3a	15 in. to 18 in.	10 15 0	2 ft. 6 in.	3 0 0
4	18 in. to 21 in.	12 10 0	2 ft. 6 in.	4 0 0
5	21 in. upwards	14 15 0	2 ft. 6 in.	4 10 0

Disc Valves, Adams' Patent Helorf, see page 112, with socket and handle.
4-in., 17/6; 6-in., 21/6; 9-in., 30/-; 12-in., 41/-; 15-in. 48/-; 18-in., 65/6.
20-in. Manhole Cover, (Fig. 30, page 129), 40/-; Dirt Box, 7/6.
Step-irons, malleable cast, galvanized, 1/3; black, 1/-.

JAMES MURRAY, Esq., County Surveyor, Paisley:—

"It gives me much pleasure to testify to the accurate working of the Automatic Flushing Syphons which you have supplied to me from time to time.

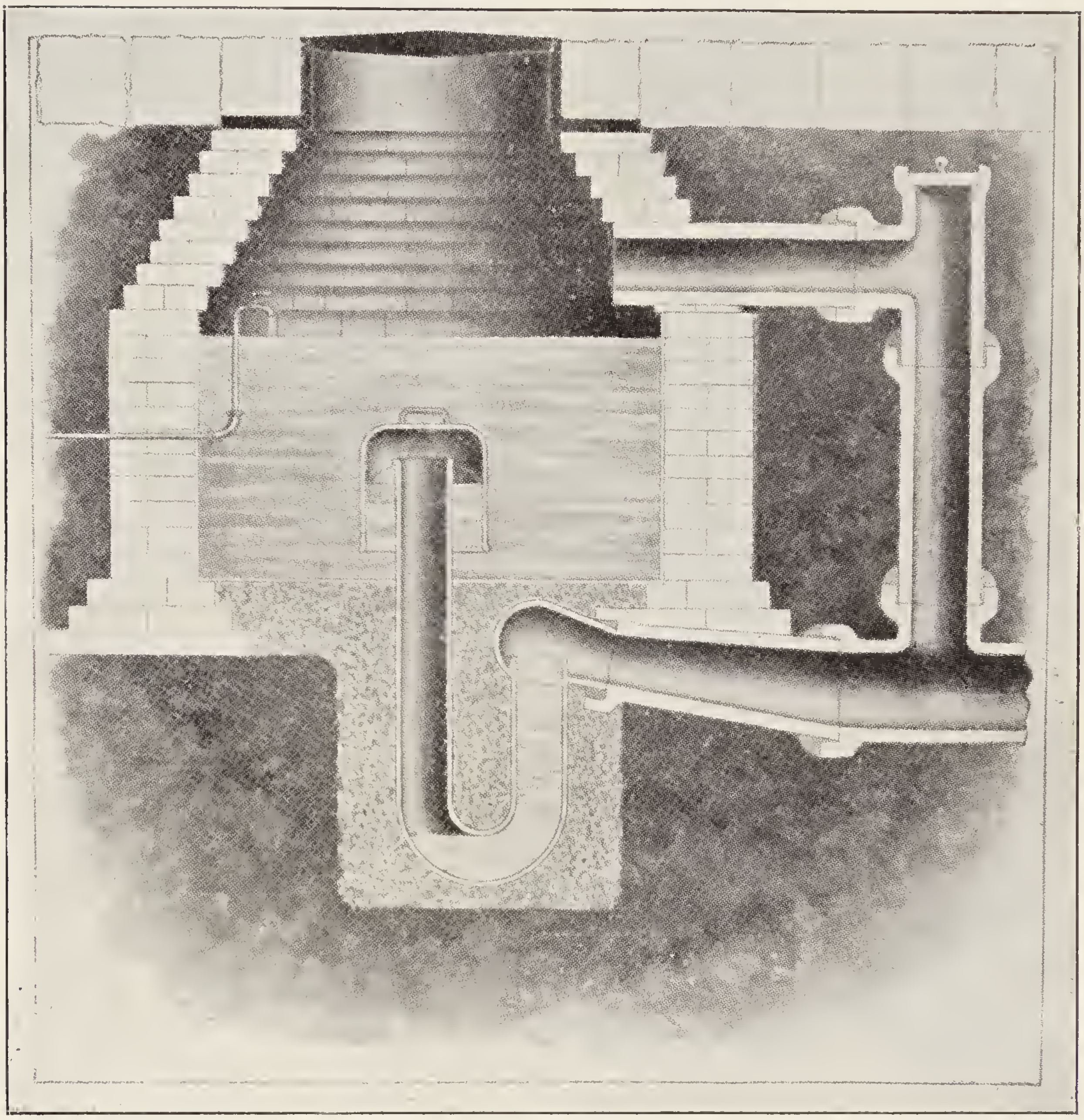
Prices for larger sizes and specials of every type upon application.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

The Adams-Miller Patents.

Type H.



THE Standard Design Adams-Miller Syphon, as shewn by accompanying ilustration, consists of the discharging limb or deep-seal trap (the discharge mouth at outlet), and the intaking limb or bell, which is placed over the longer leg of the Syphon and held securely in place by its own weight, all parts being plain castings.

Prices as on opposite page.

P. L. WISE, Esq., City Engineer, Topeka, Kansas, says:—

> " The sewers where they are used are giving no trouble whatever by reason of stoppage or foul gas, although they are the flattest in the city, while many sewers in other parts give us much trouble from these causes."

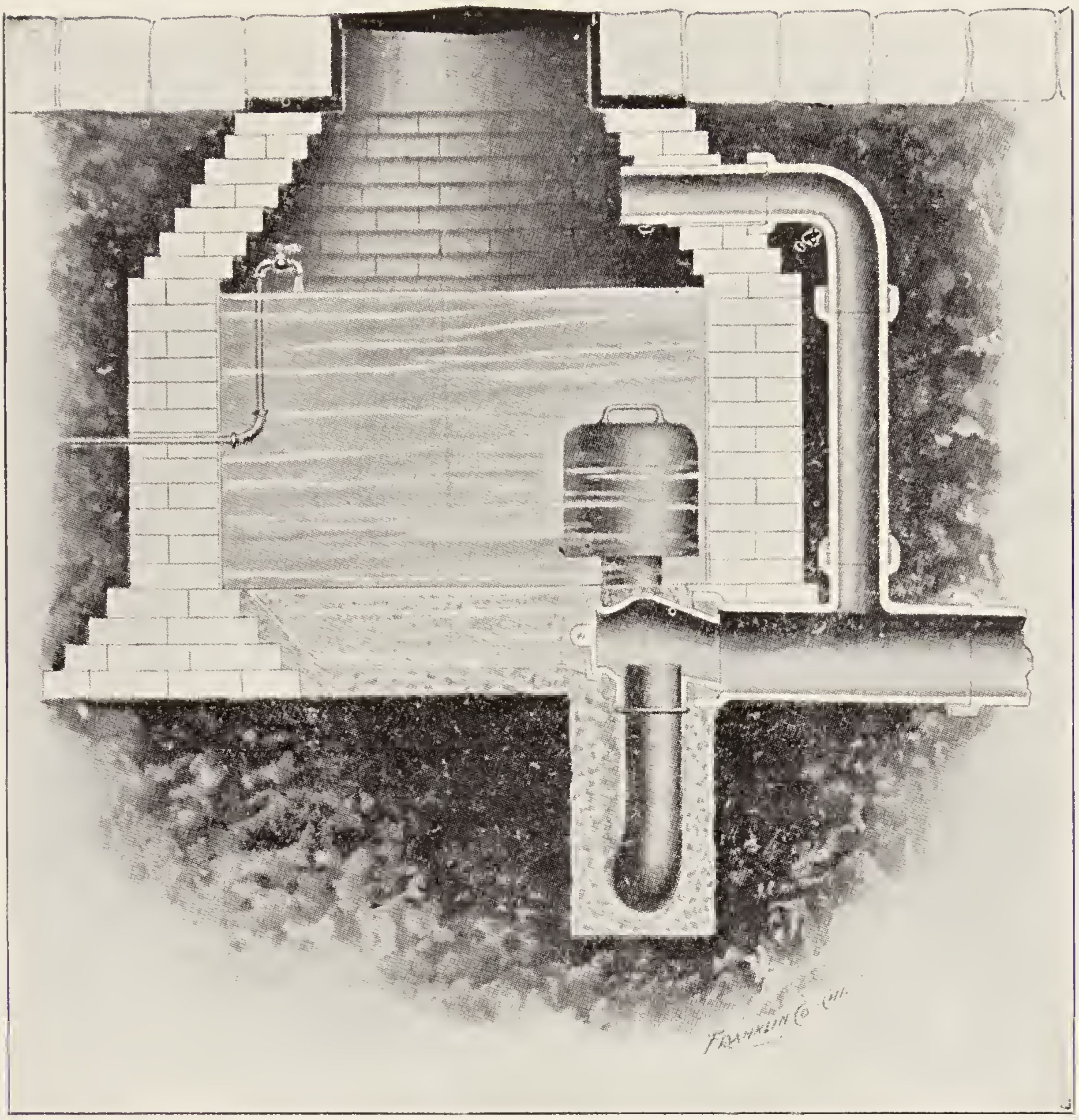
NOTE.—The combine of the Adams-Miller Syphon Patents enables us to supply whatever type is necessary, and gives us the sole right to their use or sale.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

The Adams-Miller Patents.

Type J.



Patent combined Flush Tank and Manhole.

As will be seen from the illustration a lid, or plug, (inserted in a special outlet), is provided for draining the chamber when it is desired to use it as a manhole. Room for removing the plug is secured by placing the long leg of the Syphon to one side of the chamber. The extra expense involved in the adoption of this device is so very small that it more than justifies the outlay.

PRICES FOR SYPHONS OF STANDARD DEPTH.

Size No.	To Flush Sewer		Inspection Outlet, extra	These draw
0	4 in.	£3 15 6	10/-	18 in.
2	9 in.	6 0 0	25/-	28 in.
3	12 in.	8 0 0	30/-	37 in.
4	15 in.	11 5 0	40/-	42 in.

Both the Syphon and the Sewer are accessible.

Returns shew that some 64 per cent. of all Syphons in use are ADAMS'.

☞ No specials are made in the Adams-Miller Types.

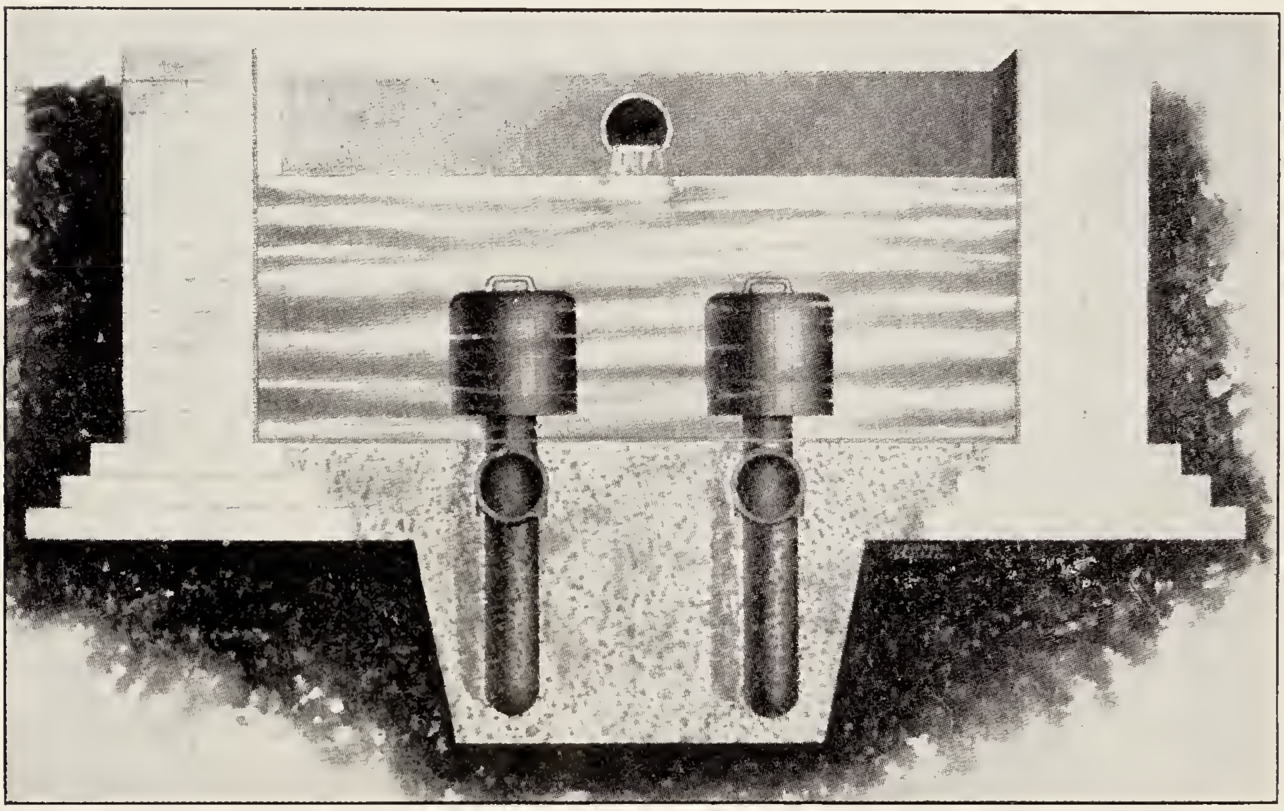
Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

For Discharging to Bacteria Beds, Revolving or Spray Distributors, or Sewer Flushing.

Adams' Patent Alternating Syphons.

Type K.



FOR discharging the contents of one Flushing Chamber alternately to one or other of two sewers, etc. These syphons are so constructed that the first discharge from the chamber will be delivered through one syphon—and the next discharge through the other and so on alternately—in this way one chamber serves for two syphons, and flushes two distinct sewers.

A. R. ROBINSON, Esq., Surveyor, Clacton-on-Sea, says:—

> "I have every reason to be satisfied with the working of the two Sewage Lifts you installed here for the purpose of lifting the sewage from the underground conveniences. They have been working now for four years and have given no trouble, and have so far cost practically nothing for repairs.

PRICES UPON APPLICATION.

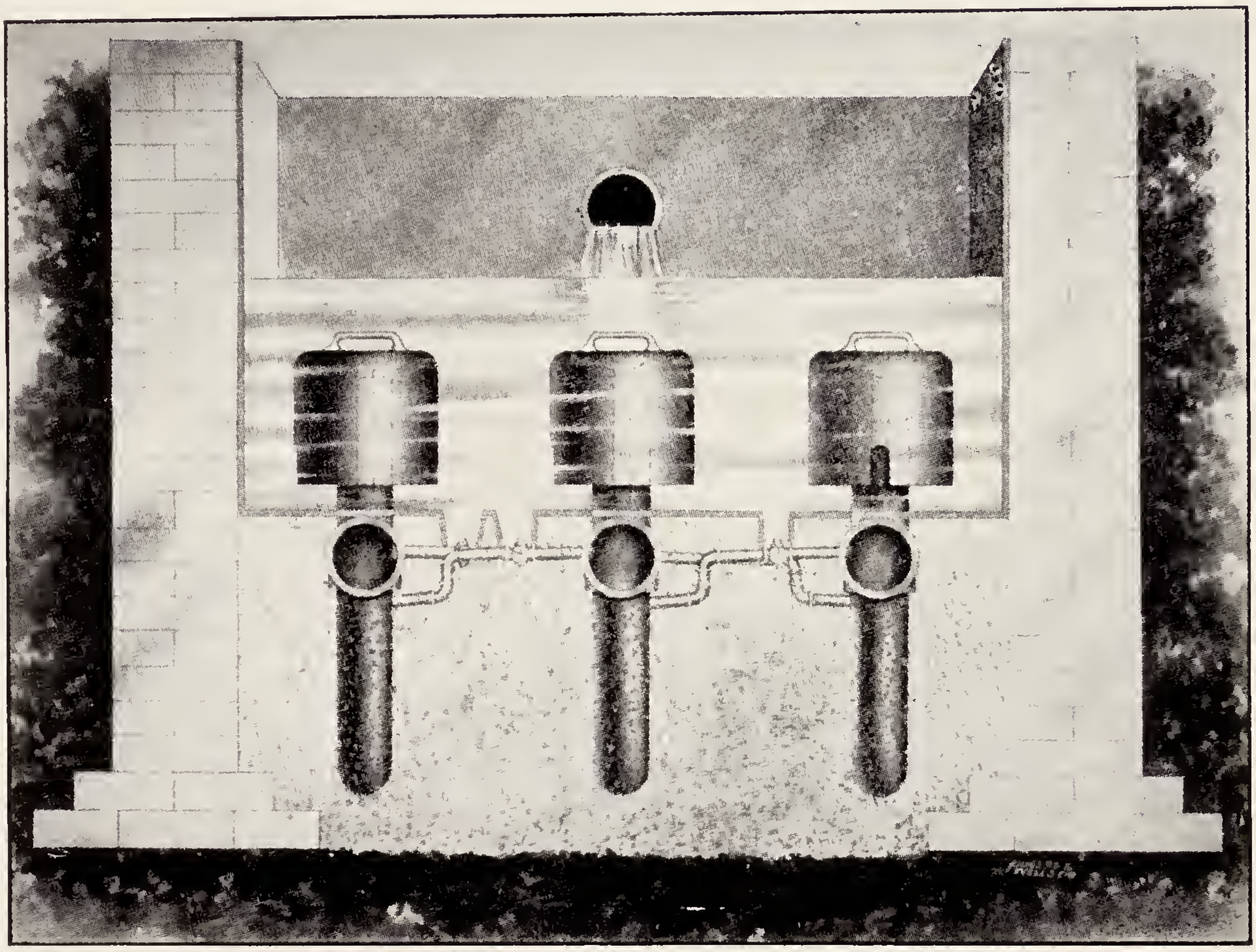
Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

For Discharging to Bacteria Beds, Revolving or Spray Distributors, or Sewer Flushing, etc.

Adams' Patent Triple Rotation Syphons.

Type L.



HERE three syphons are placed in one tank which thus serves for flushing three distinct sewers, (or dosing three distinct filters), each of which will receive automatically, and in turn, the entire contents of the tank.

E. J. BARRETT, Esq., U.D.C. Staines, writes:—

> "The 12 Rotation Syphons have proved in every way satisfactory. The working of the syphons has not only given me satisfaction, but has caused considerable surprise to others who have inspected the works."

TYPES OF FLUSHING CHAMBERS.

Syphon with double outlet.

Type M.

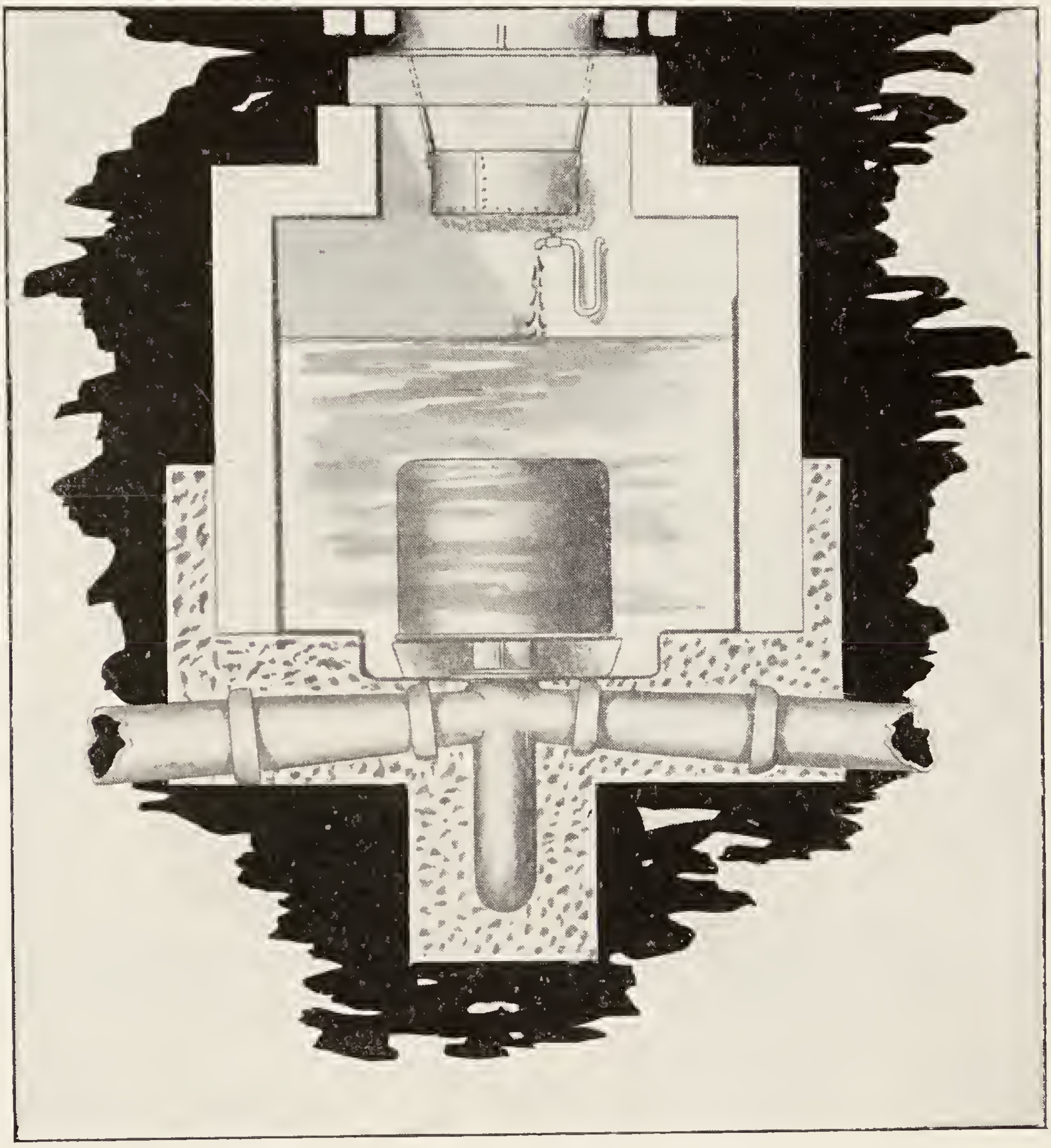


Fig. 75M.

THE Syphon shewn has a double outlet in order that its discharge may be divided between the two connected sewers. The Syphon is similar in all other respects to that shewn on page 96.

An official return shews some 64 per cent. of all Syphons used in England are ADAMS'.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

Adams' Patent "New Standard."

Type Z.

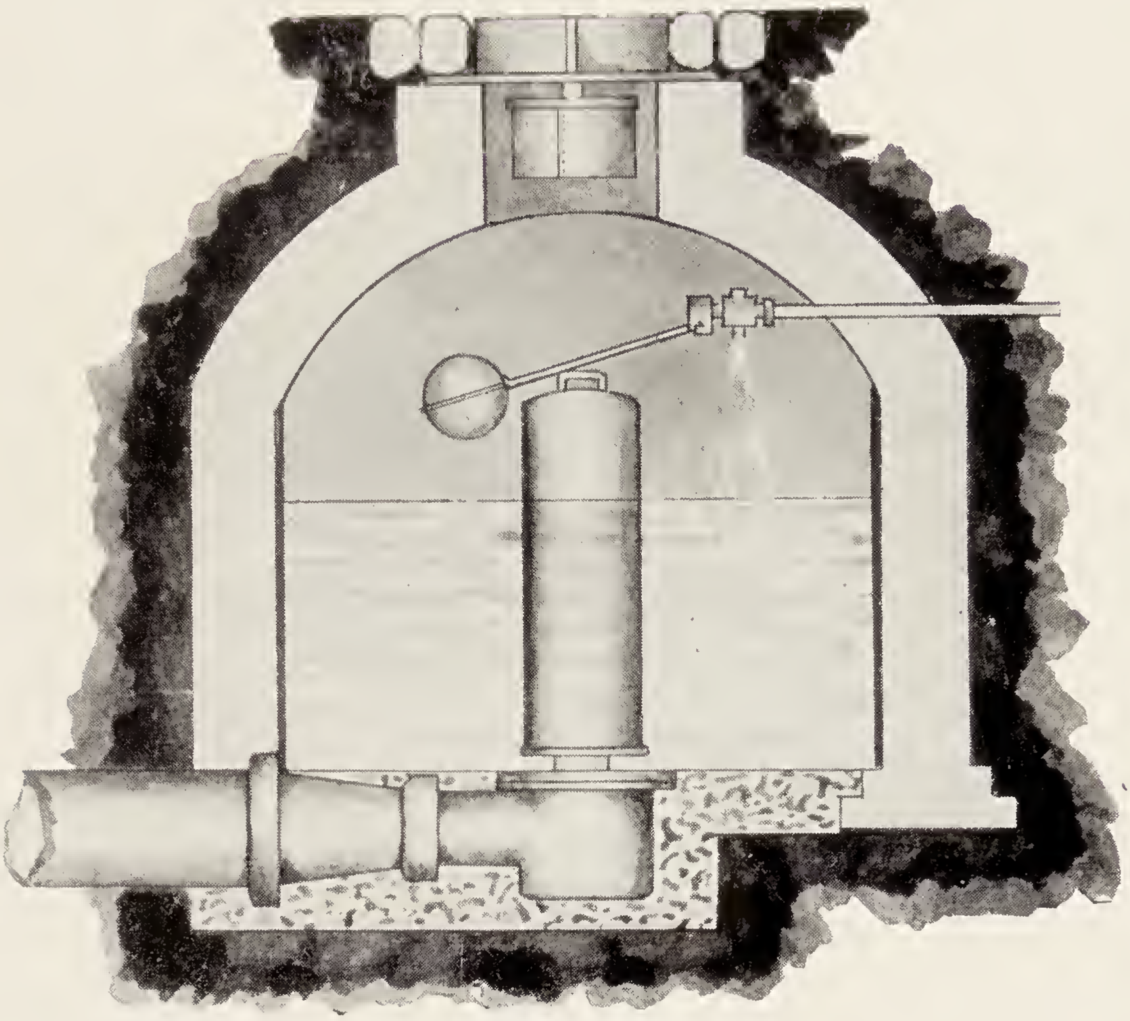


Fig. 78.

IN many positions a syphon may be used which need not necessarily work with a "drop by drop" supply. For this reason we are making, in addition to our ordinary "drop by drop" syphon, a modification, the "New Standard," at a less price. This syphon is shewn above. Its construction is such that it will start with a small flow from a reverse action ball-cock. This syphon is made in Cast Iron and also in Fireclay. No specials are made of this type.

PRICES.—"Standard," all discharge 2-ft. 6-in. of water.

In Cast Iron No. 1,	4-in. dia.,	£3 15 0	In Stoneware,	£3 10 0
,, ,, 2,	5-in. ,,	5 10 0	,,	4 10 0
,, ,, 3a,	7-in. ,,	8 5 0	,,	6 10 0

REVERSE BALL COCK	7/6
MANHOLE COVER (Fig. 30 page 129) ..	18-in., 32/6; 20-in., 40/-
DIRT BOX	18-in., 7/6; 20-in., 8/6
STEP IRONS	Unbreakable Black, 1/-; Galvanized, 1/3

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

For Discharging to Bacteria Beds, Revolving or Spray Distributors, or Sewer Flushing.

Adams' Patent Shallow Flusher.

Type G.

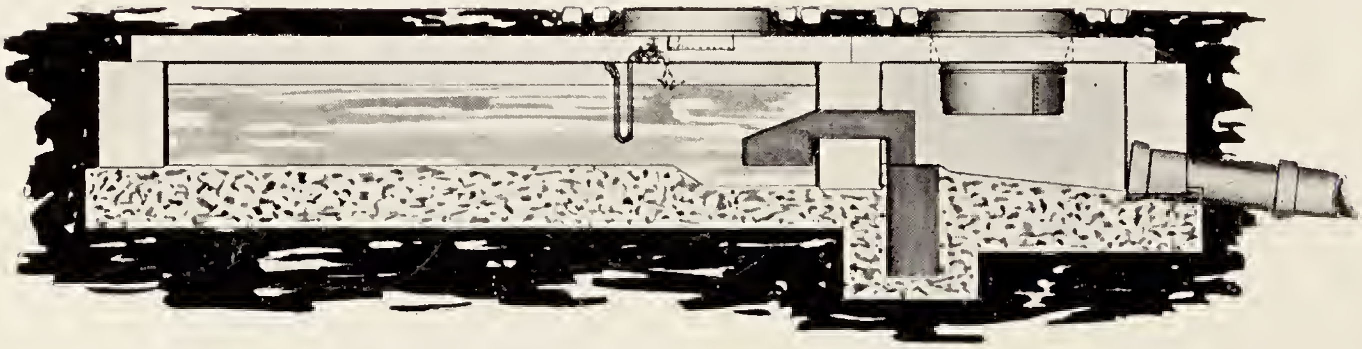


Fig. 103.

THIS Flusher—an adaptation of our Sewer Flushing Syphon—has been used chiefly to give an intermittent supply to Revolving Sewage Sprinklers, etc., where the depth for storage is limited—it is equally valuable for Sewer Flushing under like conditions, where the use of an ordinary Sewer Flushing Syphon is impossible. The apparatus will discharge a depth of water of from 6″ upwards. Prices upon application.

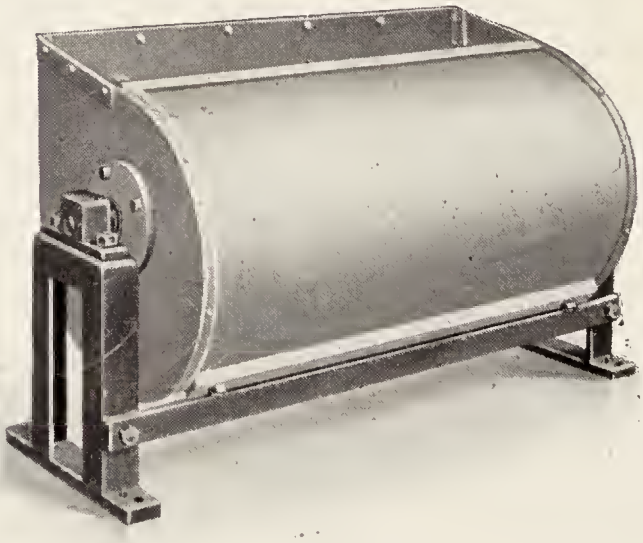
W. RAPLEY, Esq., Surveyor, Dorking:—

> "The Flushing Syphons have acted well ever since they were put into work."

B. A. MILLAR, Esq., Surveyor, Seaford:—

> "The Syphons supplied 12 months ago have given me entire satisfaction."

Returns shew that some 64 per cent. of all Syphons in use are ADAMS'.



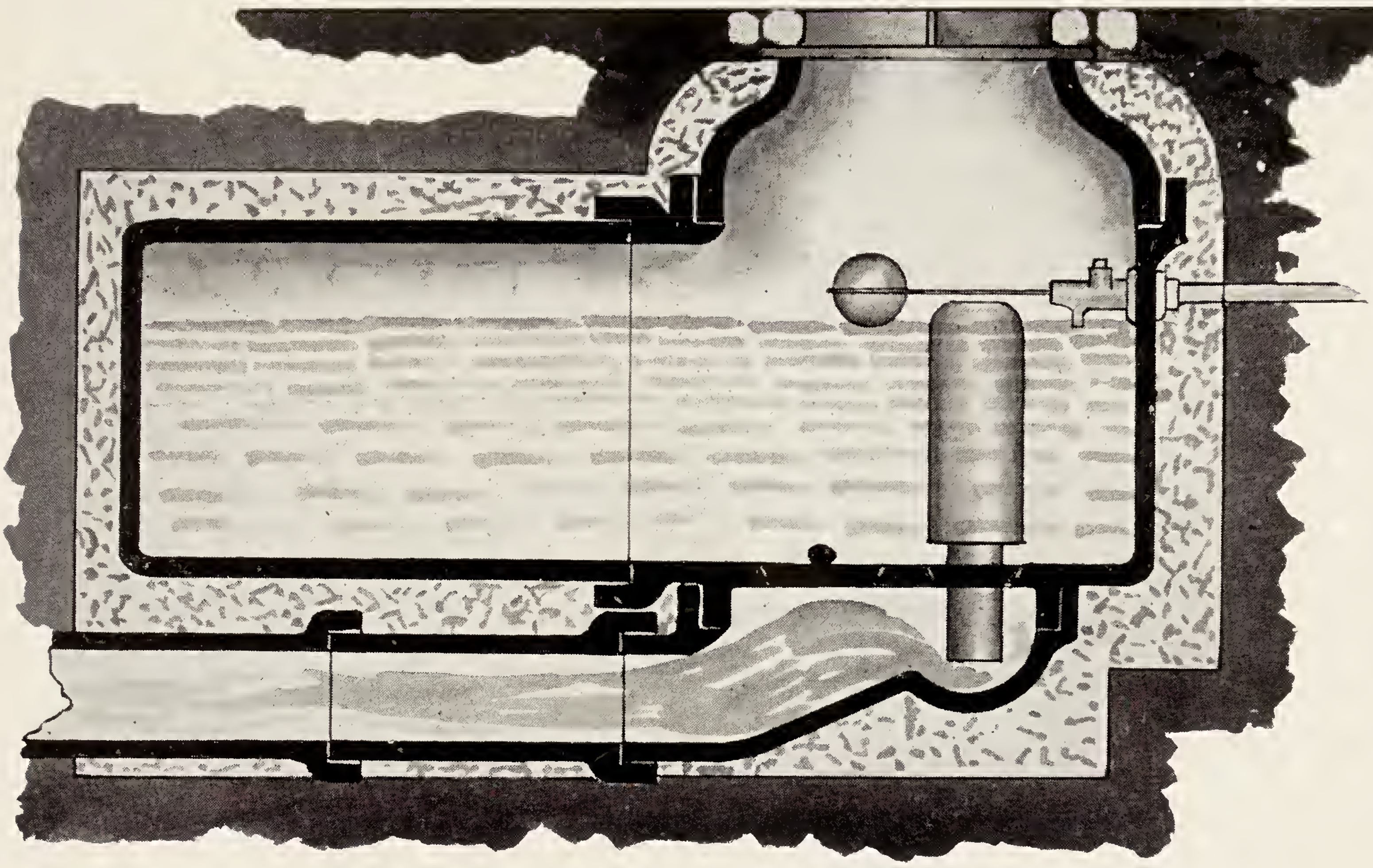
Prices of Tipping Buckets upon application.

Sewer Flushing, etc.

TYPES OF FLUSHING CHAMBERS.

Adams' Patent "New Standard" Syphon and Fireclay Tank combined.

Type T



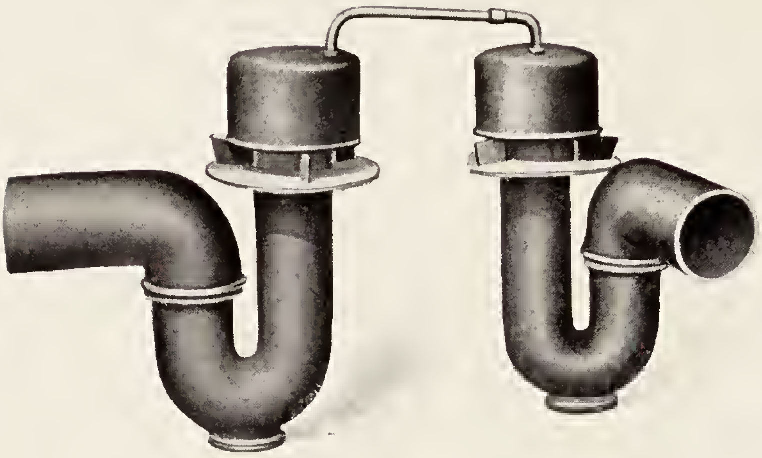
THE Syphon shewn above is supplied either in Cast-iron or Stoneware. It may be had separately for building into tanks of masonry, or complete—tank, syphon, and reverse action ball cock. Unlike our Fig. 75 Sewer Flushing Syphon, the "New Standard" will not start with drop supply—for this reason, the supply is controlled by means of the ball-cock shewn. Prices of the complete tank upon application.

For Syphon Prices see page 105.

J. W. WALSHAW, Esq., City Surveyor, Peterborough:—

> "I have pleasure in bearing testimony to the very efficient working of the several Automatic Flushing Tanks connected with the sewerage system of this city, which were supplied by you about three years ago."

Sewer Flushing, etc.



Coupled Syphons.—Fig. 77.

THESE syphons are so constructed that they will discharge either alternately or simultaneously as desired.

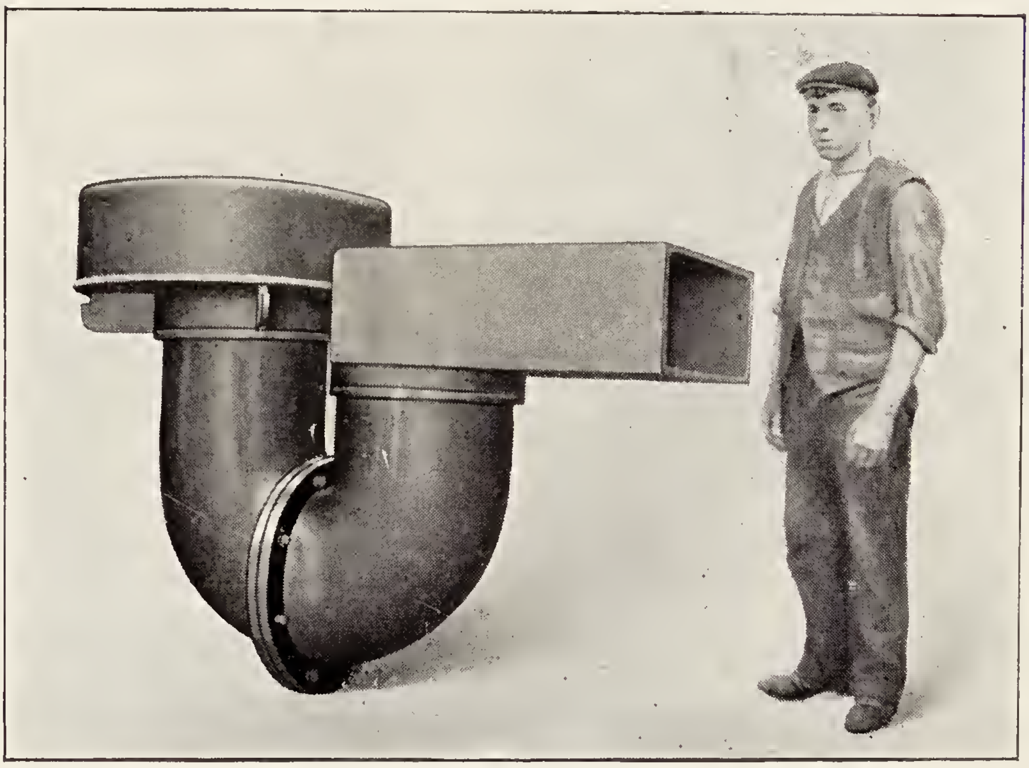


Fig. 750.

A SINGLE syphon fitted with RECTANGULAR OUTLET. The rate of discharge of these syphons depends entirely upon the conditions which govern their construction.

Upon application and receipt of necessary particulars, rates and prices will be given.

Sewer Flushing, etc.

SYPHON FITTINGS.

Fig. 80.—Taper Connection and Vent Inspection, with Rubber Ring to fit.

Syphons of dia.—	3 in.	4 in.	5 in.	6 in.	8 in.	
	25/-	28/-	35/-	45/-	60/-	etc.

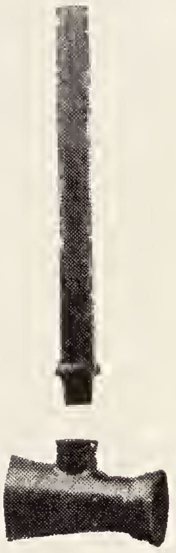


Fig. 80.

Fig. 82A.—Long Swivel Outgo, with Chain to fit for use (see page 99).

Syphons of dia.—

3 in.	4 in.	5 in.	6 in.	8 in.	9 in.	10 in.	
12/6	15/-	18/-	22/-	30/-	42/-	47/-	etc.

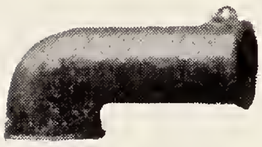


Fig. 82A.

Fig. 77.—Taper Connection, with Plate to fit.

Syphons of dia.—

3 in.	4 in.	5 in.	6 in.	8 in.	9 in.	10 in.	
15/-	17/6	22/-	27/6	37/6	50/-	62/-	etc.

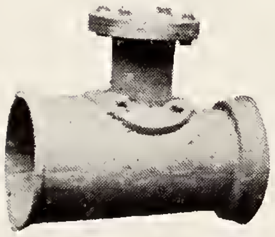


Fig 77.

Fig. 81.—Outgo, for Flushing two Sewers.

Syphons of dia.—

3 in.	4 in.	5 in.	6 in.	8 in.	9 in.	10 in.	
25/-	28/6	33/-	38/-	45/-	56/-	67/-	etc.

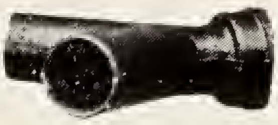


Fig. 81.

Fig. 83.—Flush Tank Counters.

1,000 discharges	-	25/-
10,000 ,,	-	30/-

Strong Taps for supply to Tanks.

$\frac{5}{8}$ in. screwed	-	-	5/-
$\frac{3}{4}$ in. ,,	-	-	6/-

Syphon prices, page 105, etc.

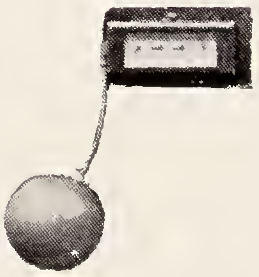


Fig. 83.

For MANHOLE COVERS see page 129.

For PENSTOCKS, etc., see page 115, etc.

CASTINGS SECTION.—For Index, see pages 5 and 5a.

Adams-Hydraulics, Limited,

MAKERS TO

H.M. OFFICE OF WORKS,
H.M. WAR OFFICE,
H.M. ADMIRALTY,

The Home, Foreign, and Colonial Offices and Governments, and the leading Engineers throughout the civilised world.

Re CATALOGUE.

Illustrations are from photographs: where deviations occur therefore, these are slight only.

Prices and Dimensions are shewn as fully as possible, and it is hoped these may be found satisfactory and helpful to users, who will in such case oblige by inserting the Figure in specification, to ensure that the particular article desired is obtained.

Estimates *(special)* will be given for numbers, or for goods not named.

Castings and Valves, unless otherwise ordered, are coated with a non-rusting, anti-corrosive composition.

Galvanized Goods will be quoted for specially.

Gun-Metal Faces. Add from 25% to 75% according to weight.

Lead Faces. Add 25%.

Guarantee. The makers are responsible for manufacture: if goods are at fault they will be rectified free of charge, but in no case will claims for damages or other charges be entertained, from whatever cause arising.

Catalogues sent free upon application.

Section **L.** Automatic Sewage Lifting.
,, **F.** Sewer Flushing.
,, **B.** Apparatus for Sewage Disposal Works, &c.
Section **C.** Sewerage Castings.
,, **D.** Domestic Sanitary Appliances.

Telegraphic Address: "SANIFERA" (All Branches).

"ADAMS-HYDRAULICS," Ltd.,
Works: York and Scotswood-on-Tyne.
London Offices: 7, Old Queen Street,
Westminster, S.W.

Disc Valves and Sluices.

ADAMS' PATENT HELORF DISC VALVE.

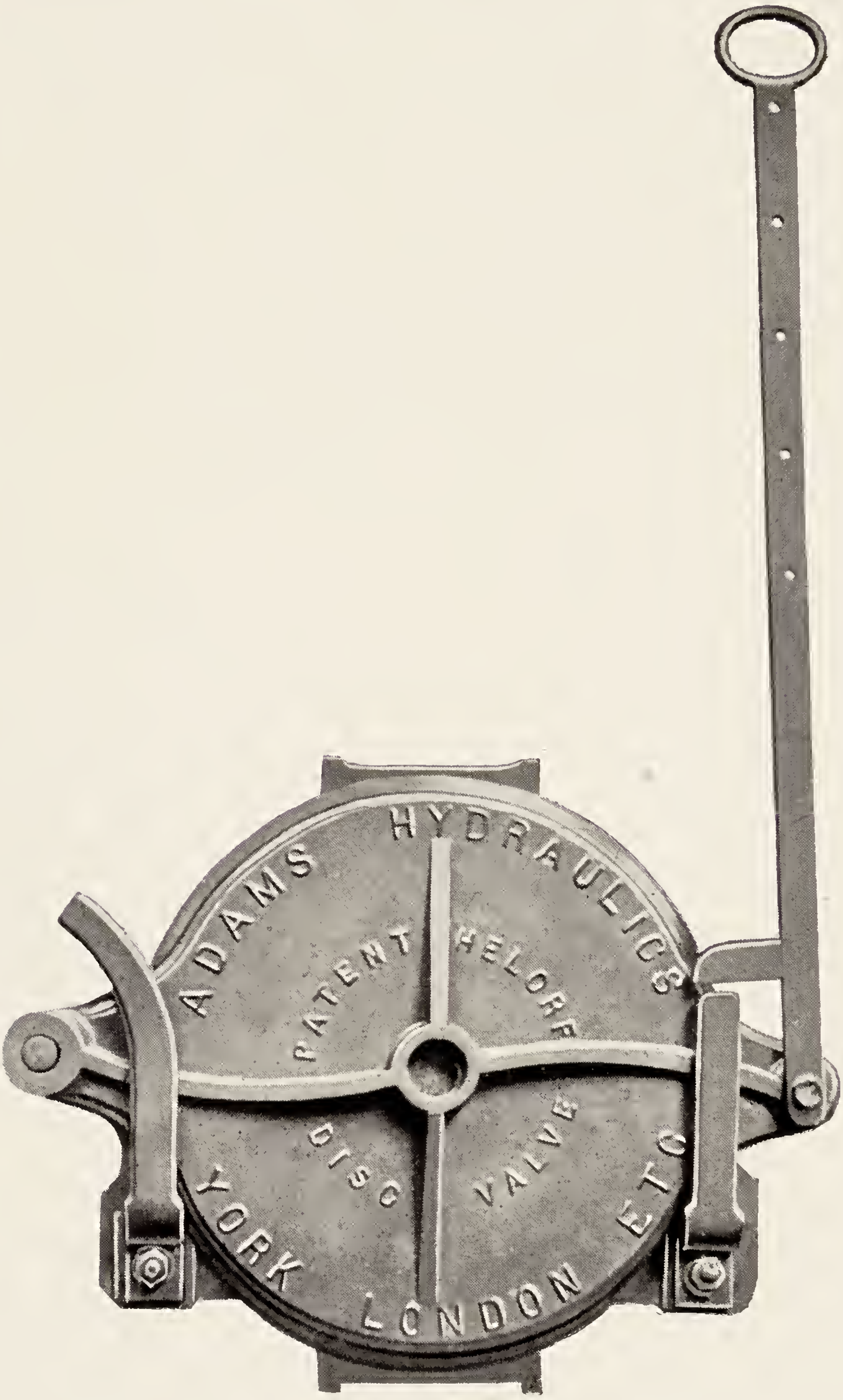


Fig. 69.—For Prices see over.

Pull lever handle slightly over to free Valve, then lift.

S. J. L. VINCENT, Esq., Borough Surveyor, Newbury, says of these Disc Valves:—

"The best I have ever seen."

Disc Valves and Sluices.

THE difficulty of opening an ordinary Disc Valve which has been left closed for a time is well known. The result is that such valves are frequently made as mere sluices, which cannot be used where a water-tight face is required. Adams' Patent Helorf Disc Valve is properly fitted; it has scraped and ground water-tight faces. It may be closed and remain closed for any length of time, but will always open without effort, the heel or lever handle making this possible. To open the valve, pull handle slightly over, then lift; the valve is free, however rusted up.

These valves are of two types—one, Fig. 69, for building into brickwork; the other, Fig. 70, with flange for bolting upon wall face. These are the only Disc Valves which give a water-tight face with easy manipulation.

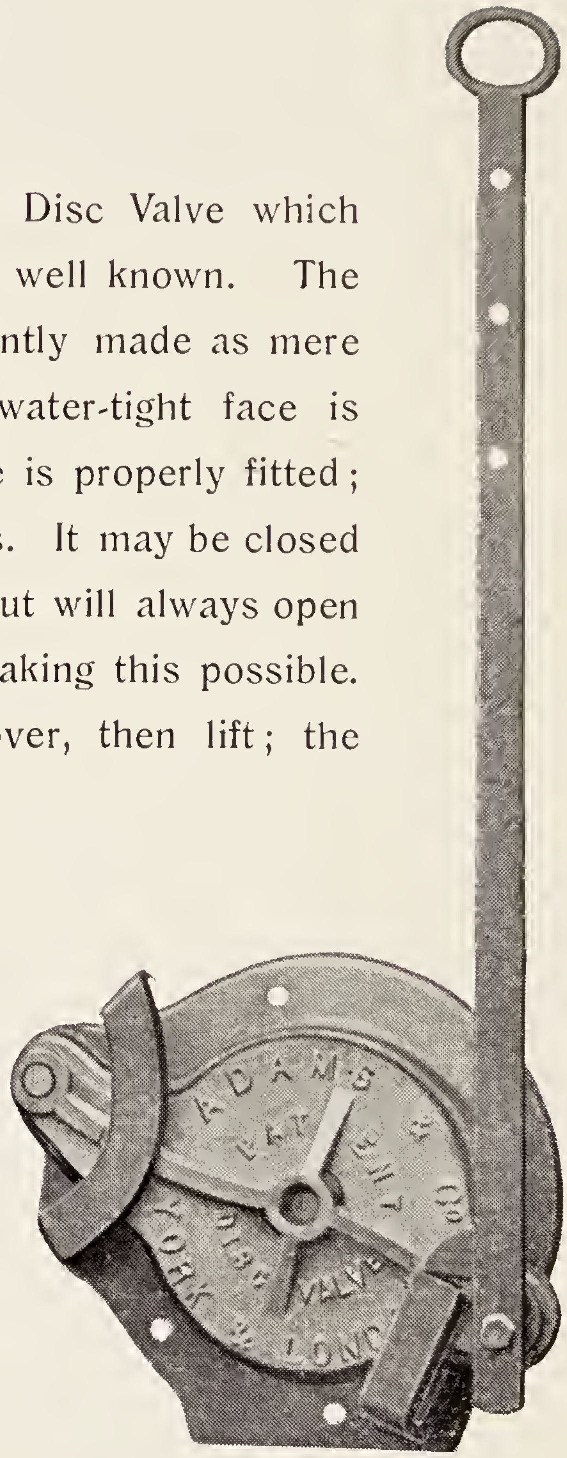


Fig. 70.

PRICES.

With 3 ft. handle and wall hook, coated black.

Fig. 69, as shewn on other side, with Socket	4-in.,	17/6	...	6-in.,	21/6	...	7-in.,	24/-
	8-in.,	27/6	...	9-in.,	30/6	...	10-in.,	36/-
	12-in.,	41/-	...	15-in.,	48/-	...	18-in.,	65/6
Fig. 70, as shewn, with Flange for bolting to wall face	4-in.,	16/6	...	6.in.,	19/-	...	7-in.,	22/6
	8-in.,	26/6	...	9-in.,	28/-	...	10-in.,	34/-
	12-in.,	38/6	...	15-in.,	45/-	...	18-in.,	60/-

Penstocks, Sluice Valves, etc.

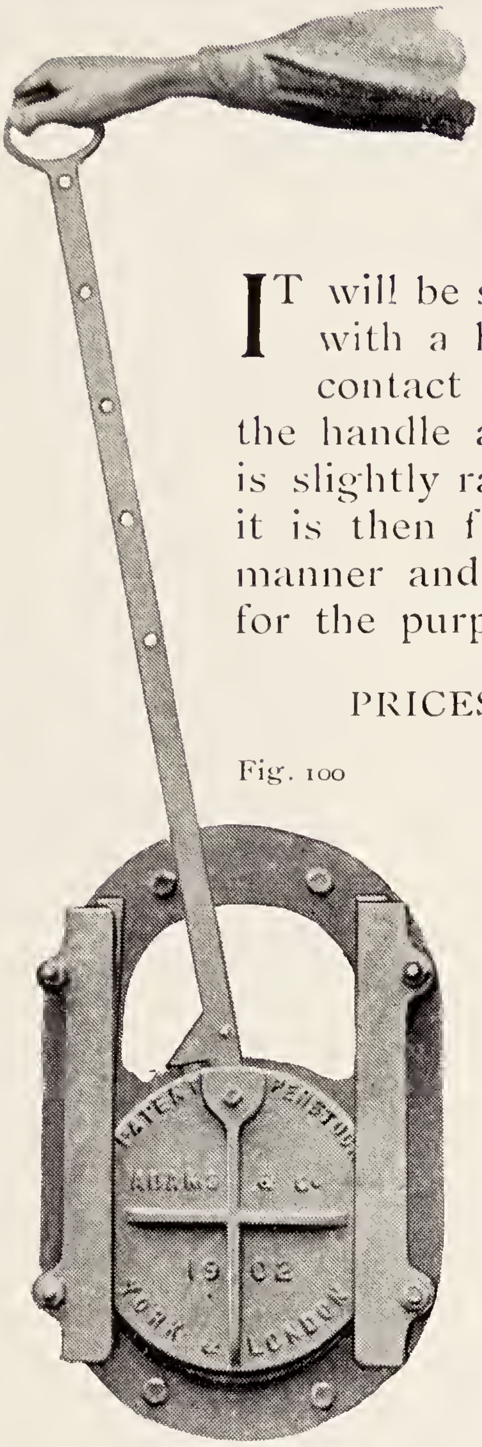


Fig. 100

Fig. 100

ADAMS' PATENT HELORF SLUICE VALVE.

It will be seen that the handle of this sluice is formed with a heel which, when thrown over, comes in contact with a stud on valve body, and acts with the handle as a lever, by means of which the door is slightly raised—however rusted up or long closed—it is then fully raised by the handle in the ordinary manner and held open upon the wall hook provided for the purpose.

PRICES, with 3 ft. handle and wall pin, painted.

	£	s.	d.			£	s.	d.
4 in.	1	0	0	... ...	9 in.	1	12	0
6 in.	1	4	0	... ...	12 in.	2	1	0
7 in.	1	7	6	... ...	15 in.	2	15	0
8 in.	1	10	0	... ...	18 in.	3	10	0

This arrangement is also used on our Disc and other Valves.

Fig. 73.

ADAMS' PATENT PENSTOCK VALVE.

Specially made for Sewage, as shewn, but without hand wheel.

	Iron Faced.				G.M. Faced.		
	£	s.	d.		£	s.	d.
4 in. dia.	1	7	6	...	1	15	0
6 in. ,,	2	5	0	...	2	12	0
9 in. ,,	4	0	0	...	4	10	0
12 in. ,,	6	8	0	...	6	18	0
15 in. ,,	10	10	0	...	11	10	0

If Spigot and Socket, add 8/-, 12/-, 20/-, 40/- and 60/-.

If Hand Wheel attached, 4/-, 5/-, 7/-, 10/-, and 15/-.

If 3 ft. Spindle and Wall Bracket, 6/6, 7/6, 8/-, 12/-. Extra per foot, 2/-.

Cross Key instead of Wheel, 7/6.

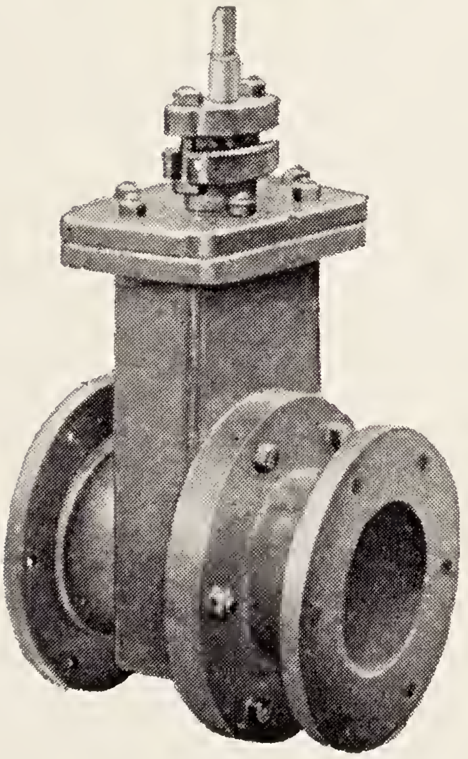
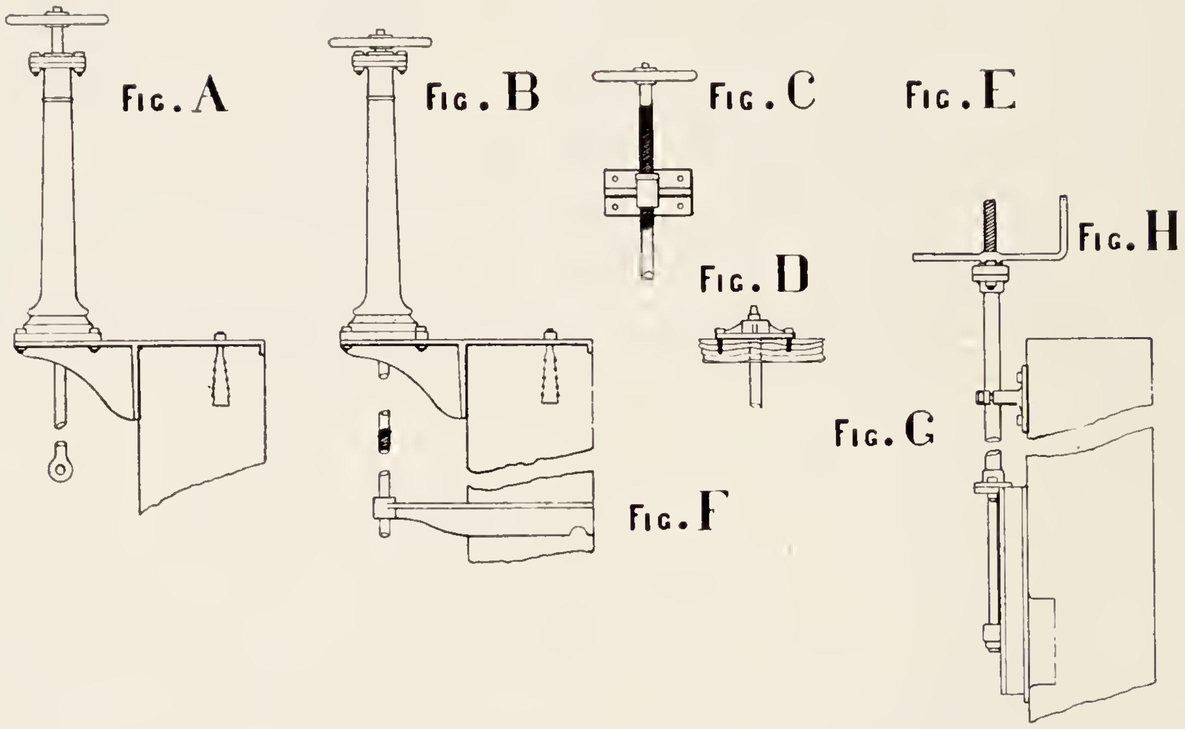


Fig. 73.

☛ For Screw-down Sluice Valves for Water Gas, etc., see page 120.

Penstocks, etc.



Fittings and Lifting Gear for Penstocks.

Fig. A.—Cast Pillar and Wall Bracket complete. Hand wheel and spindle rise when revolved to open valve.

Fig. B.—Cast Pillar and Wall Bracket complete, but hand wheel and spindle revolve without rising.

Fig. F.—Bracket for building into or bolting upon wall top, from 4/-.

Fig. C.—Bracket for bolting to wall face, with or without gun metal bush for screwed spindle.

Fig. D.—Bracket for screwing to wood for tank covers, etc., from 4/-.

Fig. G.—Wrought Pillar attached to Valve, spindle rises through bushed crank handle H or hand wheel—when latter is revolved.

Hand Wheels, from 4/- each.

Crank Handles, from 5/- each.

When ordering Penstocks give Figure of fitting required.

Penstocks, etc.

Fig. 14.—CIRCULAR PENSTOCK,

With Rack and Worm, and 6 ft. Spindle (unless otherwise ordered), square head for Box-Key-Wheel, etc.

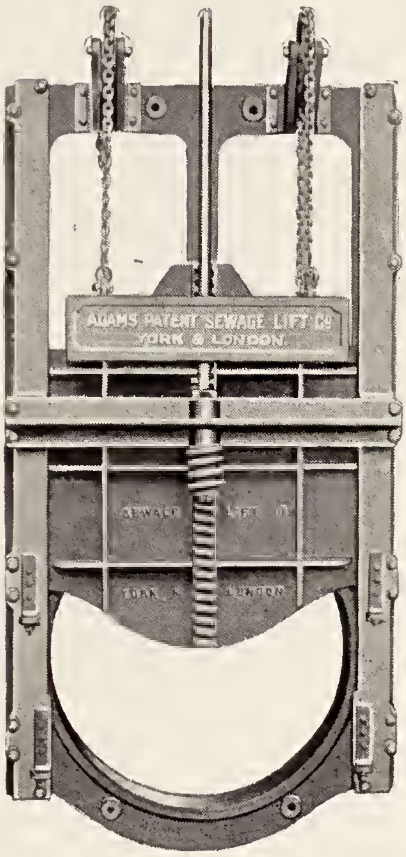


Fig. 14.

Sizes from 21 in. and upwards are fitted with adjustable wedges. All have short length of Spigot Pipe at back for building into wall, or, if specially ordered, Flanges for bolting to Flange Pipe.

Gun-Metal Faces extra, if desired.

	£	s.	d.		£	s.	d.
6 in.	1	17	6	21 in.	7	10	0
9 in.	2	15	0	24 in.	9	15	0
12 in.	3	10	6	27 in.	11	17	6
15 in.	4	0	0	30 in.	15	0	0
18 in.	5	12	6	36 in.	19	0	0

A similar Penstock (14A) is supplied at same prices, having a worm to lock or unlock face working upon spindle, by which, when free, the face is instantly drawn fully open.

Bracket for above, 2/6.

Fig. 36A.—TOP BOX

Light, 6/6; Heavy, 9/-. Lock extra, 1/6.

Fig. 36B.—SURFACE BOX,

Hinged, 6 in. × 6 in., 5/6; 12 in. × 8 in,, 7/6. Extra strong, 10/6.

Fig. 37.—FLUSHING BOX,

3 in. opening at top, 5/6; 5 in. opening at top, 6/-. Lock extra, 1/6.
Hand wheels, 4/- upwards.

Fig. 38.—TEE SPANNER,

For opening Penstock, 6/-.

Fig. 39.—SOCKET AND BAR,

Black for larger sizes	12/6
Bright	15/6

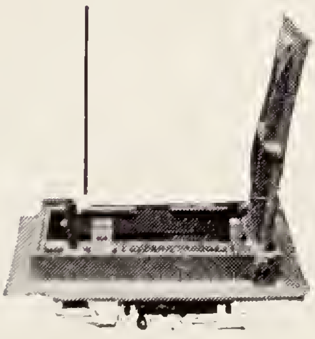


Fig. 12.
LIFTING GEAR for large sizes.

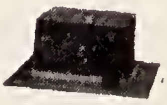


Fig. 36A.

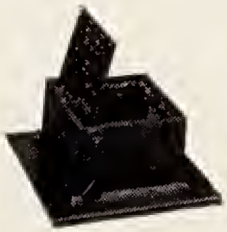


Fig. 36B.

Fig. 37.

Fig. 38.

Fig. 39.

Penstocks, etc.

These Penstocks are ground and scraped watertight and are of the best possible manufacture. They are fitted with Iron or Gun Metal faces, as desired. All Penstocks beyond 21 in. diameter have adjustable wedges.

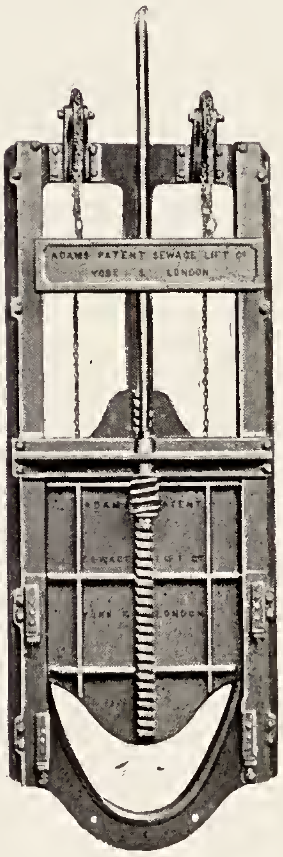


Fig. 13.

Fig. 13.—
HEAVY EGG-SHAPE RACK AND WORM PENSTOCK.

Fitted with Balance Weight and Gear.

Usual Stock Sizes.

6 ft. 0 in. × 4 ft. 0 in.
4 ft. 6 in. × 3 ft. 0 in.
4 ft. 0 in. × 2 ft. 8 in.
3 ft. 9 in. × 2 ft. 6 in.
3 ft. 6 in. × 2 ft. 4 in.
3 ft. 0 in. × 2 ft. 0 in.
2 ft. 3 in. × 1 ft. 9 in.
2 ft. 3 in. × 1 ft. 6 in.
&c., &c.

Prices upon application.

Penstocks made to Engineers' own Designs.

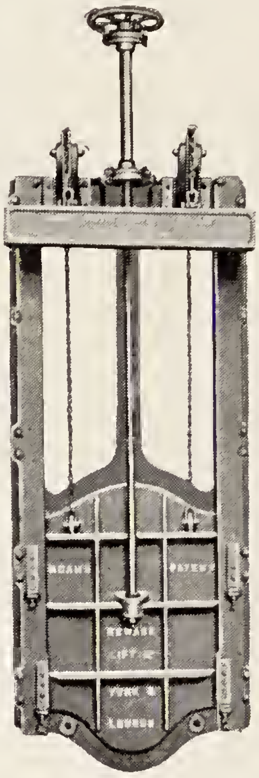


Fig. 13A.

A very similar Penstock, but with screw above water. Standard and hand wheel attached.

Fig. 15.—RESERVOIR VALVE OR SLUICE,

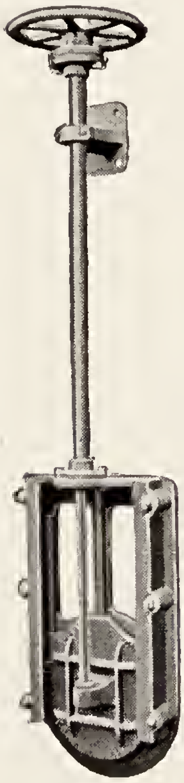


Fig. 15.

With single or double pillar (according to size), cross-bar or hand wheel, and gun-metal nut to actuating screw. May be had also with square opening, and with any of the pillars, brackets or fittings, as shewn on page 114. Length of spindle, 6ft.

	Iron Faces. £	s.	d.	Heavy. £	s.	d.
6 in.	3	5	0	... 4	0	0
9 in.	4	5	6	... 7	0	0
12 in.	5	5	0	... 9	15	0
15 in.	7	10	0	... 13	10	0
18 in.	8	18	0	... 15	0	0
21 in.	11	5	0	... 18	10	0

If cast-iron pillars and bracket required as Fig. A or B, page 114, add for 6 in., 10/- ; 9 in., 12/- ; 12 in., 15/-; 15 in., 17/6 ; 18 in., 20/-; 21 in., 22/-.

Fig. 18.—A somewhat similar Valve, with screw above water, but no pillar, the screwed portion of spindle working through a bracket attached to wall face (as Fig. 18A), with iron faces, complete with cross-bar handle or hand-wheel, bushed wall nut or bracket.

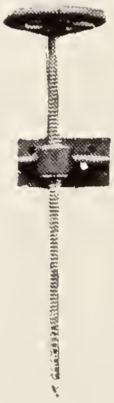


Fig. 18A.

See page 118.

Penstocks, etc.

These Penstocks are ground and scraped watertight, and are of the best possible manufacture.

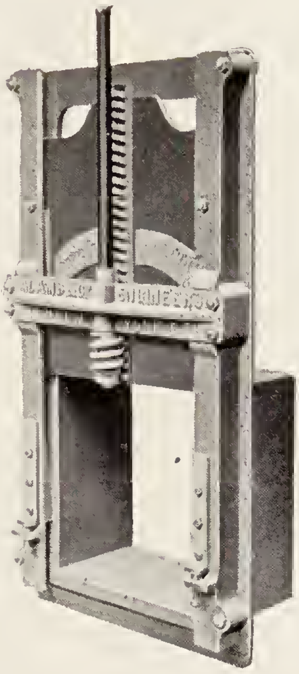


Fig. 16.

Fig. 16.—RECTANGULAR PENSTOCK, with 6 ft. Spindle.

Stock Sizes.	£	s.	d.
12-ins. × 9-ins.	3	7	6
12-ins. × 12-ins.	4	2	6
12-ins. × 16-ins.	6	0	0
18-ins. × 18-ins.	7	15	0
18-ins. × 24-ins.	8	10	0
18-ins. × 26-ins.	9	10	0

Top Box and Guide as on other side.

For Brackets for building into wall for supporting Spindle, etc. see page 114.

Sizes from 21 in. upwards have adjustable wedges.

For Fittings see page 114.

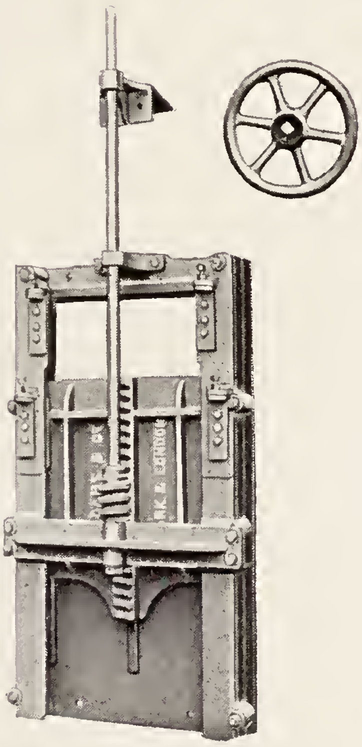


Fig. 61.

Fig 61.—

WEIR PENSTOCK, RACK AND WORM, for drawing off top water from Reservoirs, Baths, Tanks, etc.

Heavy Stock Sizes, with 6-ft. Spindle	Heavy Watertight. £	s.	d.	Light Not Guaranteed Watertight. £	s.	d.
12-ins. × 9-ins.	3	10	0	2	15	0
12-ins. × 12-ins.	4	7	6	3	15	0
12-ins. × 16-ins.	6	10	0	5	10	0
18-ins. × 18-ins.	7	15	0	6	10	0
18-ins. × 24-ins.	8	15	0	8	0	0
18-ins. × 26-ins.	9	17	6	9	0	0

Hand Wheels or Crank Handles from 4/- upwards.

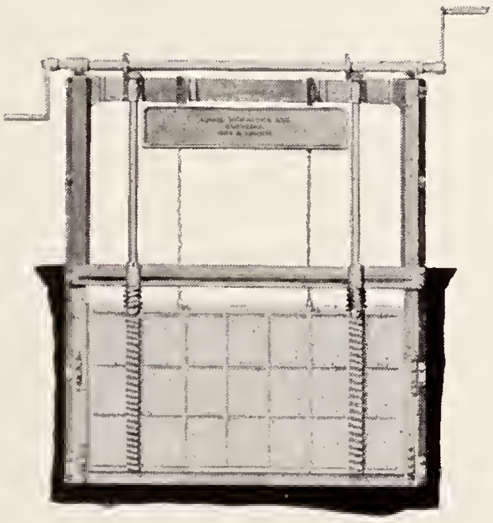


Fig. 91.

Fig. 91.—

HEAVY CAST IRON WEIR OR SLUICE for Sewage Channels, &c.

STOCK SIZES.

7-ft. 6-in. × 3-ft. 6-in.
4-ft. 0-in. × 4-ft. 0-in.
4-ft. 0-in. × 3-ft. 0-in.
4-ft. 0-in. × 1-ft. 6-in.
5-ft. 0-in. × 1-ft. 10-in.
3-ft. 0-in. × 2-ft 0-in.
2-ft. 0-in. × 2-ft. 0-in.
1-ft. 6-in. × 1-ft. 6-in.

Penstocks, etc.

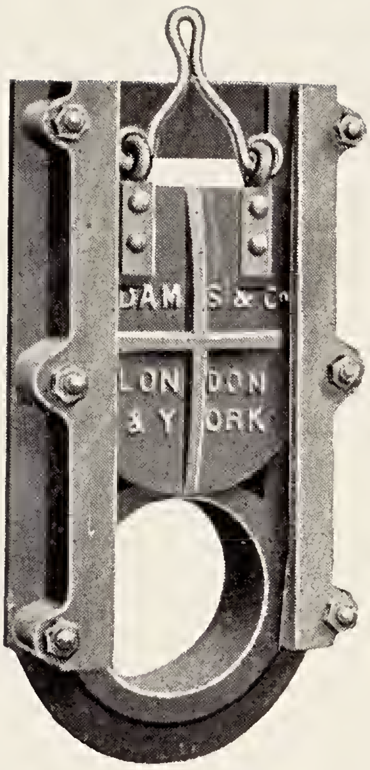


Fig. 19.

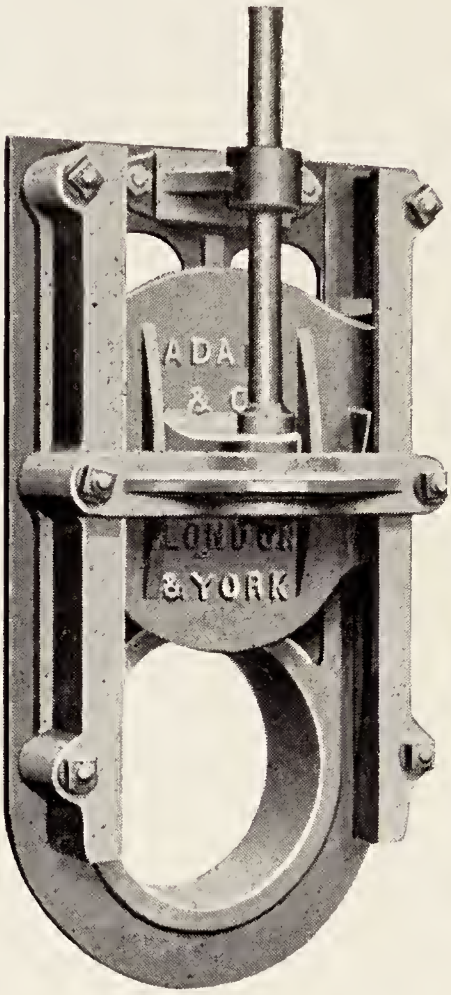


Fig. 18.

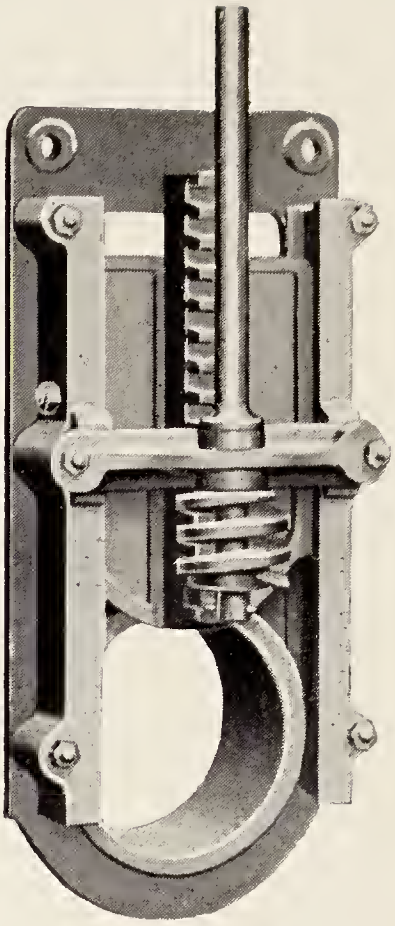


Fig. 14.

Fig. 19.—HAND FLUSHING PENSTOCK

with wedge faces and chain attachment.

	Light as a Sluice.			Heavy. Fig. 19A guaranteed watertight.		
	£	s.	d.	£	s.	d.
6-in.	1	0	0	1	10	0
9-in.	1	7	6	2	0	0
10-in.	1	15	6	2	7	6
12-in.	1	18	6	2	10	0
15-in.	2	8	6	3	5	0
18-in.	3	5	0	4	5	0

Chain, black, 6d. per ft.; galvanized 9d. Wall Hooks for same, 6d. each.

Fig. 18—RESERVOIR OR SLUICE VALVE,

with screw above water, complete with hand wheel or handle, bushed wall nut (Fig. C. page 114) or bracket—iron faces.

	£	s.	d.		£	s.	d.
6-in.	2	7	6	21-in.	8	10	0
9-in.	3	10	0	24-in.	11	0	0
12-in.	4	12	6	27-in.	13	7	6
15-in.	5	0	0	30-in.	16	10	0
18-in.	6	15	0	36-in.	20	10	0

Fig. 14.—RACK AND WORM PENSTOCK.

	£	s.	d.		£	s.	d.
6-in.	1	17	6	18-in.	5	12	6
9-in.	2	15	0	21-in.	7	10	0
12-in.	3	10	6	24-in.	9	15	0
15-in.	4	0	0	27-in.	11	17	6

For larger diameters and details see page 115.

Penstocks, etc.

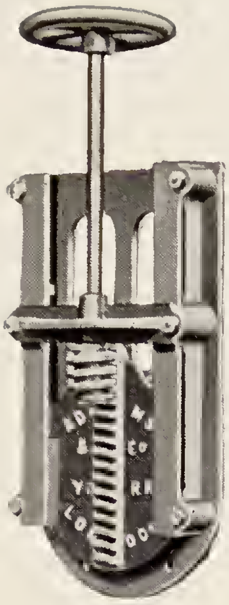


Fig. 14A.

Fig. 14A.—PENSTOCK VALVE,

For building into brickwork, with hand-wheel and bracket (in larger sizes) complete.

	£	s.	d.
9-in.	3	0	0
12-in.	4	0	0
15-in.	5	5	0
18-in.	6	15	0
21-in.	8	0	0

and upwards.

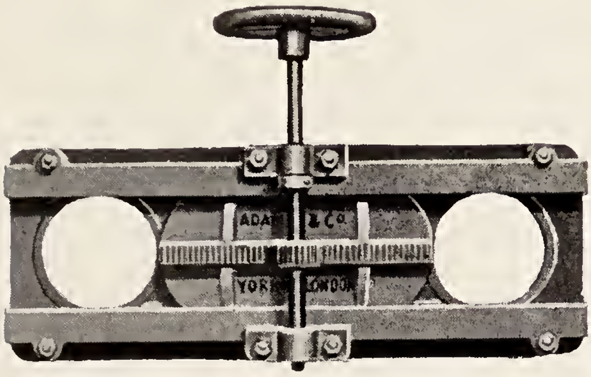


Fig. 60A.

Fig. 60A.—RACK AND WORM PENSTOCK,

Worked horizontally or vertically, controlling two outlets.

Sizes and Prices on application.

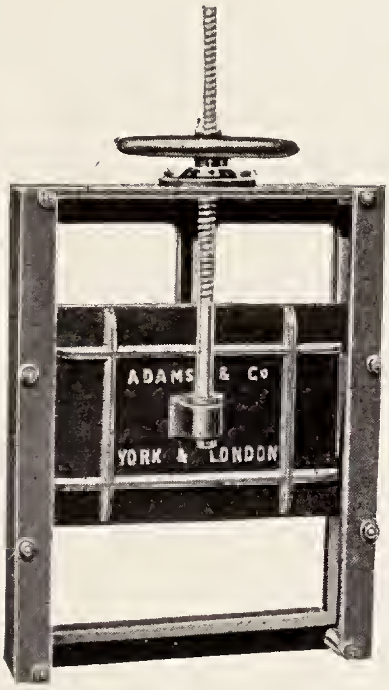


Fig. 98.

Fig. 98.—RECTANGULAR SLUICE DOOR AND FRAME.

Fitted with hand-wheel and cast door.

Spindle rises through hand-wheel.

Fig. 99.—RECTANGULAR SLUICE DOOR AND FRAME.

Fitted with long spindle working in standard.

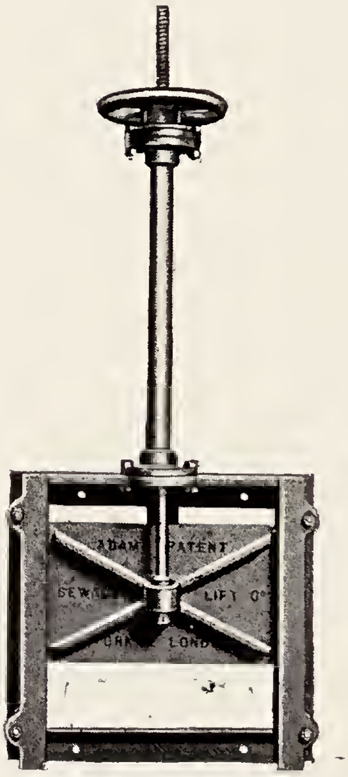


Fig. 99.

	Fig. 98. Heavy Watertight.			Fig. 98. Light, with Wrought Door and Sluice only.			Fig. 99. Cast Door with Standard.		
	£	s.	d.	£	s.	d.	£	s.	d.
12 × 6	2	15	0	2	7	6	3	5	0
18 × 12	3	10	0	3	5	0	4	0	0
18 × 18	4	0	0	3	15	0	4	10	0
24 × 12	4	17	6	4	7	0	5	7	6
24 × 14	5	15	6	5	7	6	6	5	6
20 × 18	8	0	0	7	10	0	8	15	0

Sluice Valves for Water, Sewage, Gas, etc.

IMPROVED SLUICE VALVES FOR WATER, SEWAGE, etc.

	All Gun-Metal Faces, for Water. Best Quality.			All Iron Faces, for Sewage. Third Quality.			Socket and Spigot ends extra.			Hand Wheel fastened to Spindle.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1½-in.	1	4	6	1	1	0	0	4	0	0	3	6
2-in.	1	7	6	1	2	6	0	5	0	0	3	6
2½-in.	1	14	6	1	10	6	0	6	0	0	4	6
3-in.	2	2	0	1	15	6	0	7	0	0	4	6
3½-in.	2	15	6	2	3	0	0	8	0	0	5	6
4-in.	2	17	0	2	8	0	0	9	0	0	5	6
5-in.	3	9	0	3	0	6	0	12	6	0	6	0
6-in.	4	4	0	3	12	0	0	13	0	0	6	0
7-in.	5	0	0	4	5	0	1	0	0	0	7	0
8-in.	6	2	0	5	5	0	1	1	0	0	7	0
9-in.	7	10	0	6	0	0	1	3	0	0	8	0
10-in.	9	15	0	7	0	0	1	8	0	0	8	0
11-in.	11	0	6	7	15	0	1	17	0	0	9	0
12-in.	12	7	6	9	0	0	2	6	0	0	12	0

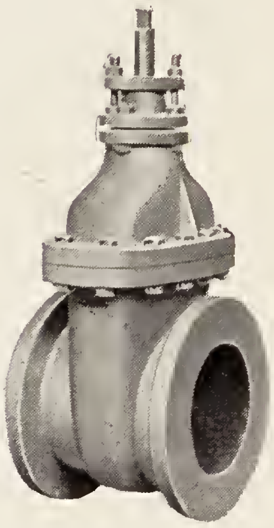


Fig. 72.

Crank Handle, 5/6; Tee Spanner, 7/6.

A light, cheap Valve is also supplied, for which prices will be given upon application.

Fig. 73.—ADAMS' PATENT IMPROVED SLUICE VALVE,

For Sewage, made with single wedge face.

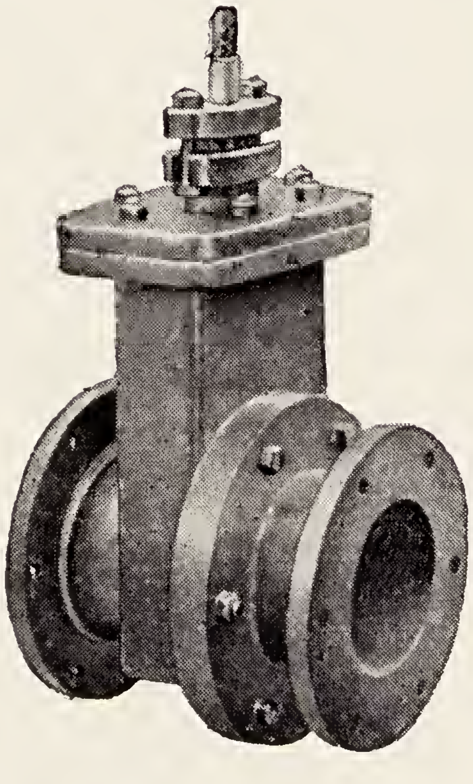


Fig. 73.

	Iron Faces.			Gun-Metal Bushed.			Spigot and Sockets, add
	£	s.	d.	£	s.	d.	
4-in.	1	7	6	1	15	0	8/-
6-in.	2	5	0	2	15	0	12/-
9-in.	4	0	0	4	10	6	20/-
12-in.	6	8	0	6	15	6	40/-
15-in.	10	10	0	11	10	0	60/-

Hand-wheel fastened to spindle.

4-in.	6-in.	9-in.	12-in.	15-in.
4/-	5/-	7/-	10/-	15/-

If 3 ft. of Spindle Screw above water and Wall Bracket (as Fig. 18A, see page 116) extra to Valve prices:—

4-in.	6-in.	9-in.	12-in.	15-in.
15/-	18/6	20/6	25/6	35/6

Extra per foot after 2/-

Cross Key instead of Wheel, 7/6.

For Top Boxes and Surface Boxes, see page 113.

Floating Arms and Valves, etc.

ADAMS' PATENT FLOATING ARMS FOR SEWAGE, ETC., FOR DRAWING OFF TOP WATER FROM SETTLING TANKS, ETC.

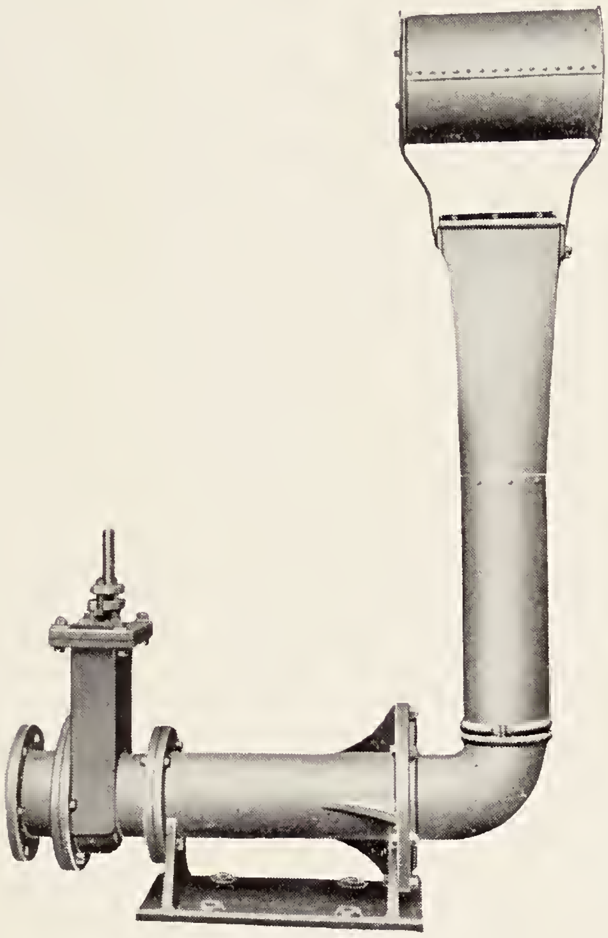


Fig. 6.

THE construction of these Arms is extremely simple—two disc faces with a loose gun-metal ring take the wear. The Arms are supplied without the base plate for building into wall, or with the base plate for bolting down to tank floor. The extension tube and float is made in galvanized iron or in copper. Stock sizes draw 4 ft.

PRICES.

Floating Arm without base plate or valve.

	Galvanized Iron.			Copper.			Add for base plate.	Extra per ft. depth. Galvanized.	Copper.
	£	s.	d.	£	s.	d.			
4-in.	5	15	0	6	5	0	10/-	3/-	4/6
6-in.	6	12	0	7	12	0	12/-	4/6	6/-
8-in.	9	0	0	10	5	0	15/6	6/-	8/-
9-in.	11	5	0	12	10	0	18/-	7/-	10/-
12-in.	14	10	0	16	10	0	25/-	10/-	12/-

Larger sizes upon application.

Add for Valves (Adams' Patent Fig. 73) for Sewage at prices shewn on opposite page.

For Floating Weir or Gauge, for giving uniform supply to Filters, etc., see also page 81.

Tide and Flap Valves, etc.

CIRCULAR AND BACK PRESSURE.

THESE Valves are ground and scraped watertight, and are of the best possible manufacture.

Fig. 26.—DOUBLE OR TRIPLE HUNG (according to size), FLAP VALVES.

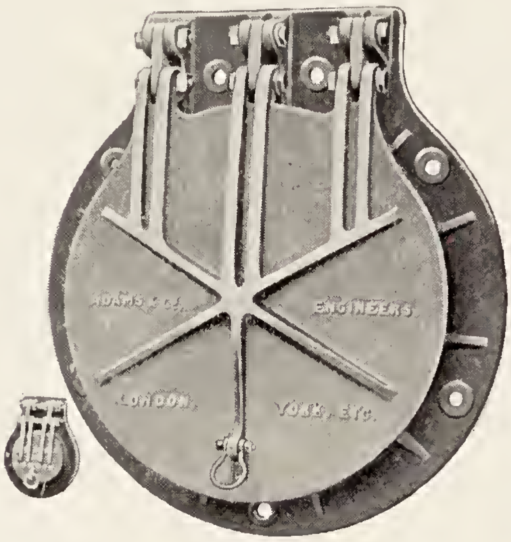


Fig. 26.

	Iron Faces.			If Gun-Metal Bushed.		
	£	s.	d.	£	s.	d.
6-in.	0	18	0	1	2	0
9-in.	1	4	0	1	9	0
12-in.	1	8	6	1	14	9
15-in.	1	15	0	2	2	0
18-in.	2	8	0	2	16	0
21-in.	3	5	0	3	15	0
24-in.	4	18	0	5	1	0
30-in.	6	0	0	6	17	0
36-in.	7	10	0	8	13	0
42-in.	12	10	0	14	0	0
48-in.	19	10	0	21	0	0

For Oval and other Flaps, see page 124.

Chain, 6d. per foot, black; galvanized, 9d.

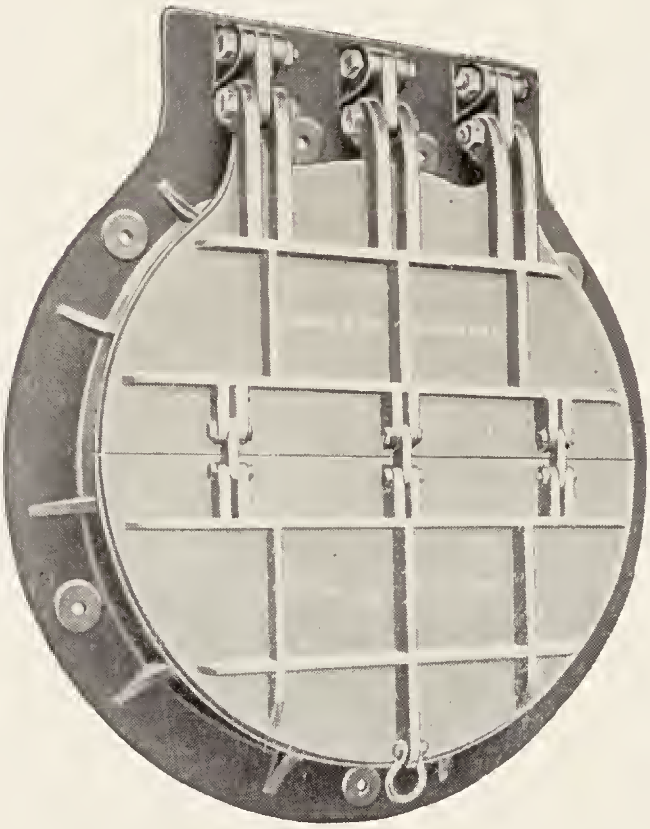


Fig. 26A.

Fig. 26A.

DOUBLE OR TRIPLE HUNG FLAP,

For Large Sewers, with Flap in two halves.

This Flap is made as shewn with Flange, or as Fig. 25, *i.e*, bolted upon 24-in. length of cast-iron spigot or socket pipe.

Prices upon application.

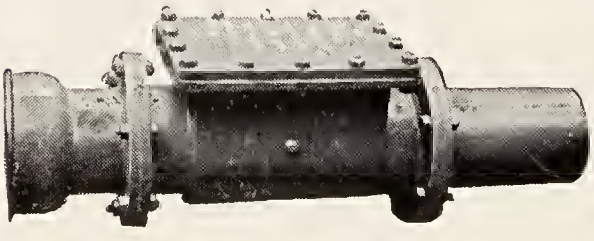


Fig. 24.

Fig. 24.

RETENTIVE VALVE,

With single hung Flap and Flange Ends. Spigot and Sockets are extra.

	3 in.	4 in.	6 in.	9 in.	12 in.	15 in.
Light	27/6	32/6	47/6	80/-	130/-	190/-
Heavy	35/-	40/-	55/6	90/-	150/-	216/-
Gun-Metal Faces, extra	6/-	7/-	8/6	10/-	15/6	30/-
Socket and Spigot,	7/-	9/-	13/-	23/-	46/-	65/-

Inspection Boxes similar to above, but without Flap. Prices upon application.

☞ *For Gun-Metal and Lead Faces, etc., see note on page 110.*

Tide, Flap, and Air Valves, etc.

These Valves are ground and scraped watertight, and are of the best possible manufacture.

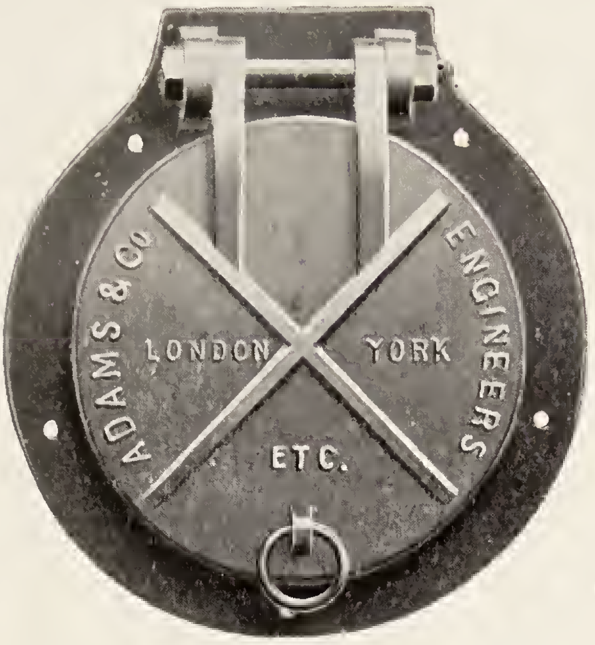


Fig. 20.

Fig. 26.—

SINGLE HUNG FLAP VALVES

as shewn with bored and fitted best cast malleable iron links.

	Iron Faces.			Gun Metal Bushes or Lead Faces.		
	£	s.	d.	£	s.	d.
6-in.	0	7	6	0	15	0
9-in.	0	11	6	1	0	0
12-in.	0	15	6	1	7	6
15-in.	1	5	6	1	15	0
18-in.	1	10	0	2	7	6

Prices for larger sizes upon application. Chain and hook 6d. per ft., black; galvanized, 9d.

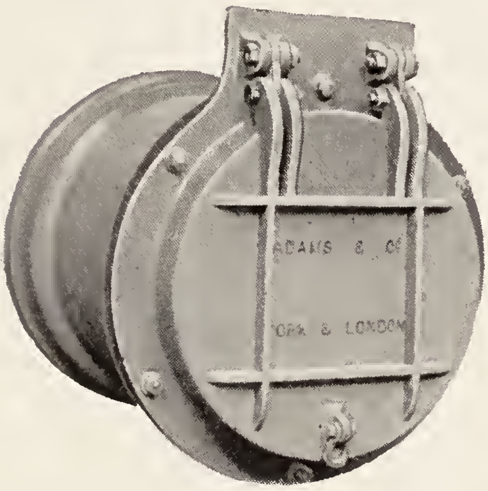


Fig. 25.

Fig. 25.—DOUBLE HUNG FLAP,

On 24-ft. length of cast-iron pipe (socket to fit earthenware pipe, unless otherwise ordered.

				If Gun-Metal Bushed.			If Flap as 26A on Spigot Pipe		
	£	s.	d.	£	s.	d.	£	s.	d.
6-in.	2	7	6	2	4	0	1	8	0
9-in.	2	17	0	3	2	0	2	2	6
12-in.	3	10	0	3	16	0	2	15	6
15-in.	4	15	0	5	2	0	3	12	6
18-in.	6	0	0	6	8	0	4	15	0
21-in.	8	18	6	9	18	0	7	0	0

And upwards.

Light Chain for ditto, if required, 9d.; extra strong, 1/3 per ft.

Fig. 25A.—AIR FLAP, not illustrated.

As Fig. 25B, but on 2-ft of cast iron socket pipe.

6-in.	£1	5	0	9-in.	£1	10	0	12-in.	£2	15	6
15-in.	3	7	6	18-in.	5	0	8	21-in.	7	0	0

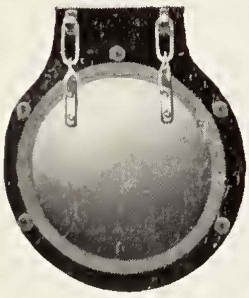


Fig. 25B.

Fig. 25B.—LIGHT ALUMINIUM FLAP,

Hung on shackles to cast flanges

6-in.	9-in.	12-in.	15-in.	18-in.
12/-	18/6	25/-	35/-	55/-

Or on short spigot only for cementing to socket of earthenware pipe.

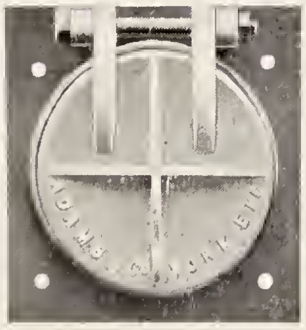


Fig. 26A.

Fig. 26A.—SINGLE HUNG FLAP VALVE,

Light Pattern; all iron. Sizes over 12-in., unless otherwise ordered, have circular body as Fig. 26.

4-in.	6-in.	9-in.	12-in.	15-in.	18-in.
6/-	7/6	11/6	15/-6	25/-	30/6

If fitted with Gun-Metal Brushes.

4-in.	6-in.	9-in.	12-in.	15-in.	18-in.
8/6	10/6	14/-	20/-	30/-	40/-

☞ *For Gun Metal and Lead Faces, &c., see note on page 110.*

Tide and Flap Valves, etc.

THESE valves are ground and scraped watertight, and are of the best possible manufacture.

Fig. 23.—RECTANGULAR FLAP VALVES.

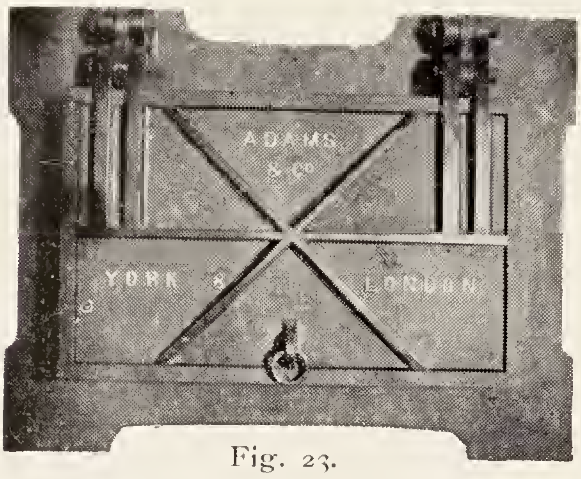


Fig. 23.

In.		In.		Iron Faces. £	s.	d.		If Gun-Metal Bushes. £	s.	d.
18	×	12	..	2	12	6	...	2	15	6
24	×	8	...	2	18	6	...	3	2	0
24	×	18	...	5	0	0	...	5	5	0
30	×	18	...	6	10	0	...	6	18	0
30	×	24	...	7	10	0	...	8	10	0
40	×	36	...	12	10	0	...	13	0	9

Fig. 22.—FLAP VALVE

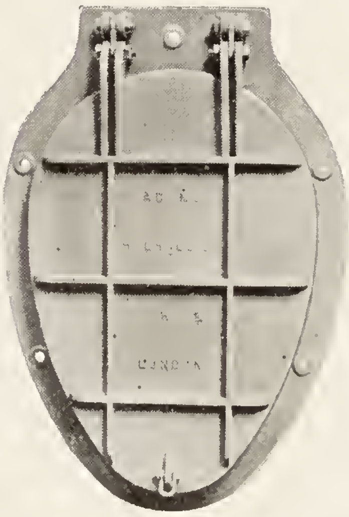


Fig. 22.

For Egg-shaped Sewer, as shewn.

In.		In.		Iron Faces. £	s.	d.		If Gun-Metal Bushes. £	s.	d.
24	×	16	...	5	15	0	...	6	0	0
32	×	22	...	6	18	0	...	7	2	7
36	×	24	...	8	5	0	...	8	12	6
42	×	33	...	10	7	0	...	10	15	0
48	×	32 and 72 in. × 48 in., etc.								

Or if Flap in two parts, prices on application.

Fig. 22x.—TRIP GATES OR FLUSHING DOORS,

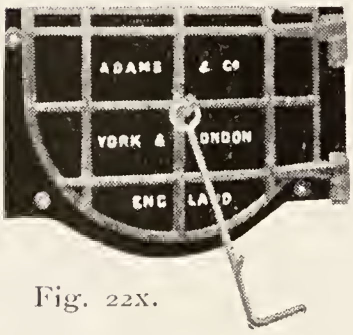


Fig. 22x.

Lead Faced, Gun-metal Bushed.

For 21 in. Sewer.	For 36 in. Sewer.
,, 24 in. ,,	,, 48 in. ,,
,, 30 in. ,,	and upwards.

Prices upon application.

☞ *For Gun Metal and Lead Faces, see page 110.*

URBAN SMITH, Esq., C.E., Parliament Street, S.W.:—

"I am not in the habit of giving Testimonials in matters of this sort, but I have nothing but good to say with regard to your Syphons. I used to regard them as somewhat expensive, but having tried cheaper patterns, I have come back again to yours, which have always worked—as far as my experience goes—very satisfactorily.

Sluices, Hand Stops, etc.

For IRRIGATION CHANNELS, etc.

Fig. 93A.—HAND STOP OR SLUICE.

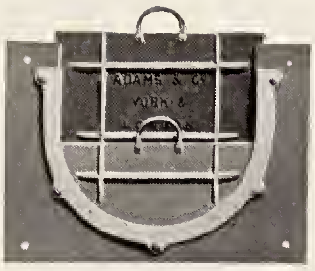


Fig. 93A.

Fig. 93A. Whole Sluice.	£	s.	d.	Fig. 93B. Half Sluice.	£	s.	d.
6-ins.	0	10	0	6-ins.	0	9	6
9 ins.	0	12	6	9-ins.	0	11	6
12-ins.	0	15	0	12-ins.	0	14	0
15-ins.	1	3	6	15-ins.	1	2	6
18-ins.	1	7	6	18-ins.	1	6	0

Fig. 94A.—DEEP CHANNEL SLUICE,

Semi-Circular, with Wrought Regulation Handle.

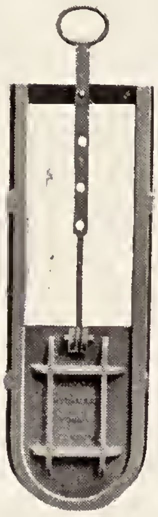


Fig. 94A.

	£	s.	d.
6-ins.	1	0	0
9-ins.	1	5	0
12-ins.	1	10	0
15-ins.	2	0	0
18-ins.	3	0	0

Fig. 97A.—DEEP CHANNEL SLUICE.

Square, with Wrought Regulation Handle.

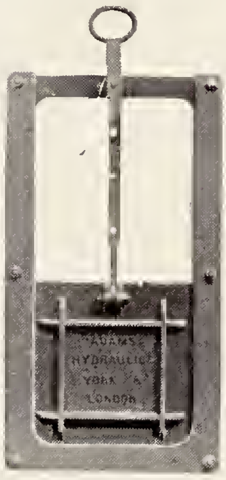


Fig. 97A.

Depth		Width	£	s.	d.
6-ins.	×	10-ins.	1	5	0
8-ins.	×	12-ins.	1	10	0
8-ins.	×	18-ins.	1	15	0
12-ins.	×	12-ins.	1	15	0
15-ins.	×	15-ins.	2	10	0
12-ins.	×	18-ins.	2	15	0
18-ins.	×	18-ins.	3	10	0
18-ins.	×	24-ins.	4	10	0

W. J. LOMAX, Esq., Bolton, writes:—

> "I have used your Syphons extensively, chiefly for intermittently applying and distributing sewage over filtration areas. I have employed them of various sizes and under varying conditions, and have found them to be most satisfactory. Some of them have been in constant operation for *over five years*, and have, with little or no attention, been *discharging automatically night and day during the whole time*."

Sluices, Hand Stops, etc.

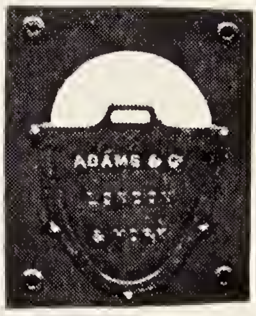


Fig. 93.

Fig. 93—HAND STOP or SLUICE DOOR,

With plate, as shewn.

	Half Frame. £ s. d.		Whole Frame. £ s. d.
6 in.	0 10 6	...	0 12 6
9 in.	0 12 6	...	0 15 6
12 in.	0 16 0	...	0 17 6
15 in.	1 3 0	...	1 7 6
18 in.	2 7 6	...	1 15 0

Specials as Fig. 96 or others on Application.

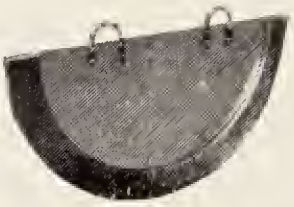


Fig. 96.

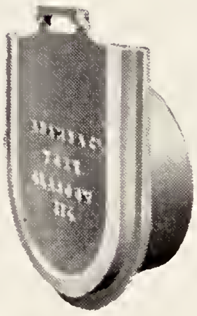


Fig. 94A, with Spigot

Fig. 94.—HAND STOP, without Spigot,

For Irrigation Channels, etc.

			£ s. d.		The same, but with short Spigot cast on back, 94A. £ s. d.
6 in.	...	...	0 6 0	...	0 10 6
9 in.	...	...	0 10 0	...	0 14 6
12 in.	...	...	0 15 0	..	0 19 9
15 in.	...	...	1 2 6	...	1 7 6
18 in.	...	...	1 7 6	...	1 15 0

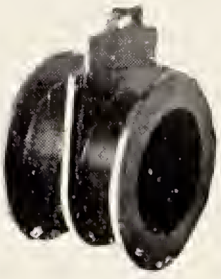


Fig. 95.

Fig. 95.—HAND STOP,

With Flange at each end.

					£ s. d.
6 in.	..	...	...	...	1 2 6
9 in.	..	...	...	...	1 10 6
12 in.	...	...	...	...	2 2 0
15 in.	...	...	...	...	2 10 6
18 in.	...	...	...	...	3 5 6

Fig. 97.—RECTANGULAR CHANNEL STOP or SLUICE,

With cast, wrought, or wood door, as ordered.

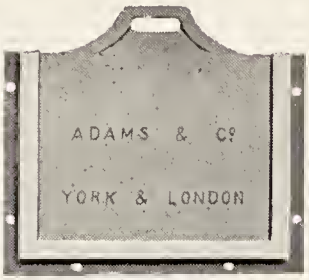


Fig. 97.

					£ s. d.
9 × 10	...	...	...	.	0 6 6
8 × 12	...	...	...	...	0 8 6
8 × 18	...	...	...	...	0 15 0
12 × 12	...	...	...	...	0 12 0
12 × 18	...	...	...	...	1 0 0
18 × 18	...	...	...	...	1 5 0
18 × 24	...	...	...	...	1 15 0

and upwards.

If fitted with catch to hold door at any height, add 1/-.

Thos. R. Smith, Esq., Kettering, says of 44 of our Sewer Flushing Syphons, selected after tests of those manufactured by other makers:—

"The whole of the 44 Automatic Syphons you supplied are working satisfactorily. I send you an order for two more."

Sewage Screens, Baskets, Ladders, Sludge Plugs, etc.

FITTINGS FOR DISPOSAL WORKS.

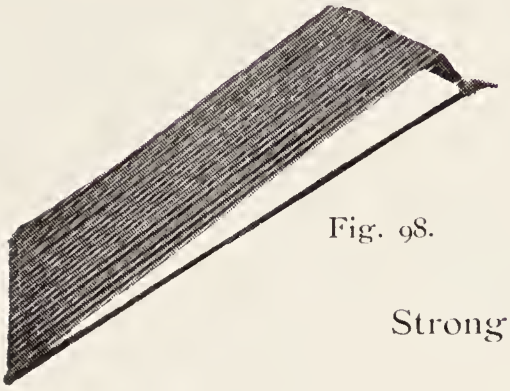


Fig. 98.

WROUGHT SCREENS.

Prices
on application.

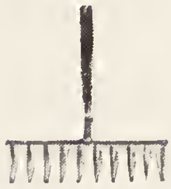


Fig. 99.

Strong Rake, curved teeth, for ditto.

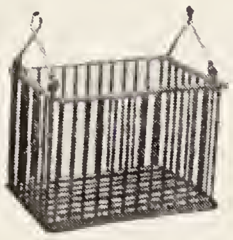


Fig. 96.—STRONG RECTANGULAR BASKET.

In.	In.	In.		Iron.	Brass.
18 ×	12 ×	12 deep	... ...	40/	55/-
21 ×	15 ×	15 ,,	... ...	47/	70/-

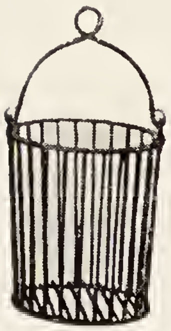


Fig. 102.—CIRCULAR BASKET.

STRONG.

Dia.	Depth.		Iron.	Brass.
15 in.	18 in.	... ...	42/6	55/-
18 in.	21 in.	... ...	65/-	80/-

Fig. 92.—SLUDGE PLUG,

With 4 ft. spindle, hand wheel, and bracket, or square head for key.

	£ s. d.	Brass Bushes.	Bend, extra.
3 in. ...	1 12 6 ...	add 6/- ...	6/6
4 in. ...	1 17 6 ...	,, 7/6 ...	7/6
6 in. ...	2 10 0 ...	,, 10/6 ...	15/-
9 in. ...	3 10 0 ...	,, 15/- ...	20/-
12 in. ...	6 0 0 ...	,, 20/- ...	30/-

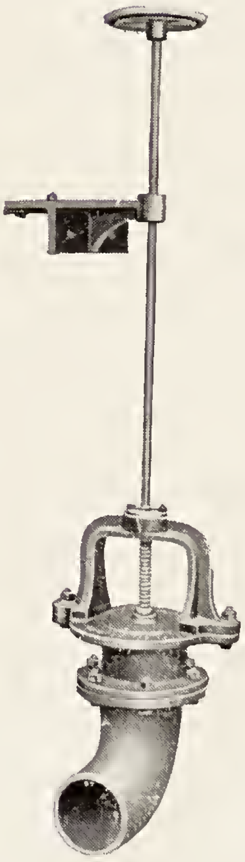


Fig. 92.

LADDERS.

Fig. 100A.—Curved. Fig. 101.—Straight.

Strong wrought-iron Ladders for Sludge Wells, Sewage Tanks, etc.

Prices upon application.

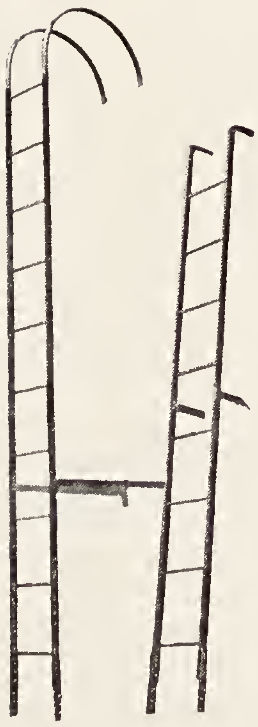


Fig. 100A. Fig. 101.

Chain Pumps, etc.

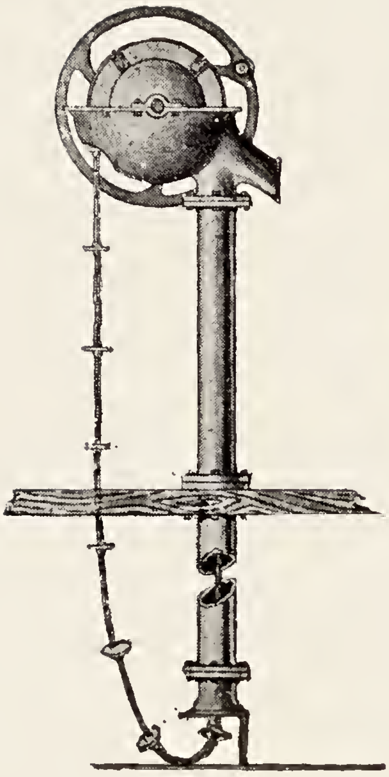


Fig. 90.

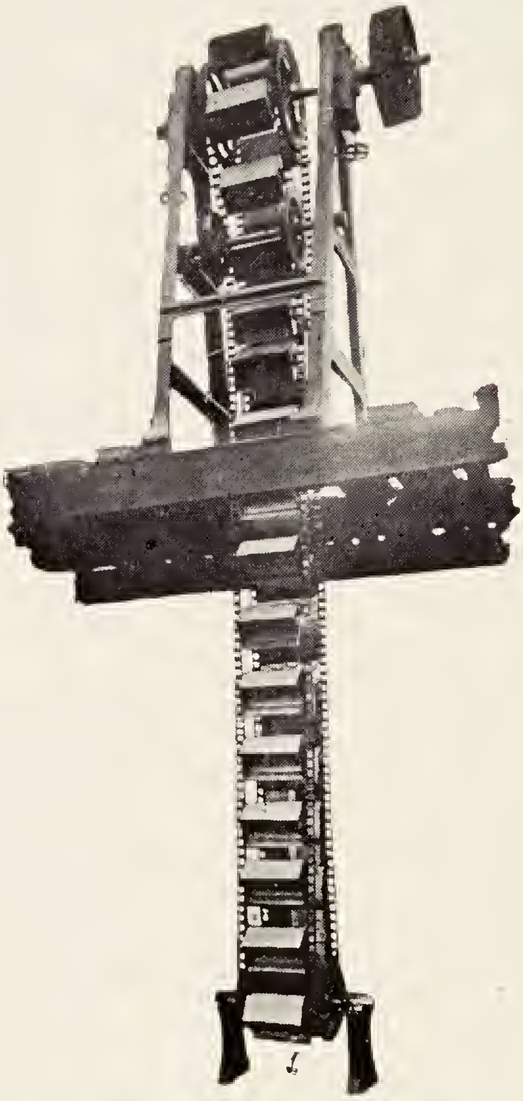


Fig. 90x.

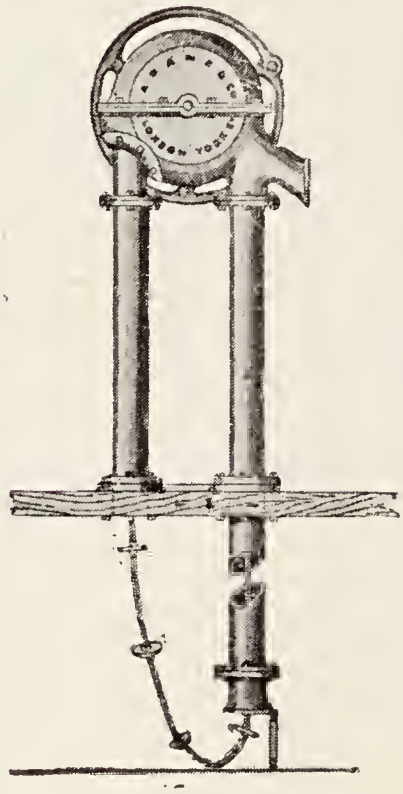


Fig. 91.

Figs. 90 and 91 are fitted with Adjustable Base, and in Stock sizes measure 12 feet under spout.

Fig. 90x is a Power Sludge Elevator; the Chain Pumps may also be fitted for power.

	Fig. 90. Semi-Covered.			Fig. 91. Covered.			Extra per foot over 12 feet.		
	£	s.	d.	£	s.	d.	£	s.	d.
Prices .. 2 in.	3	5	0	3	15	0	0	3	0
2½ in.	3	10	0	4	5	0	0	3	6
3 in.	3	15	0	4	15	0	0	4	6
3½ in.	4	15	0	5	10	0	0	6	0
4 in.	6	0	0	7	5	0	0	4	6

Extra Wheel and Handle, 12/6. Brass Bushes extra, 12/6.

Manhole Covers, etc.

Fig. 30.—CIRCULAR COVERS.

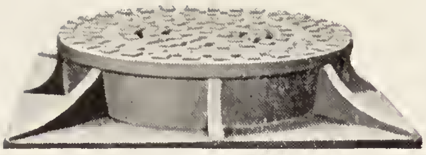


Fig. 30.

Clear Opening in inches	15	18
Diameter of Base ..	24 × 24	28 × 28
With Elm Blocks with or without vent openings	35/-	42/6
Cast-iron Top, with or without vents	25/-	32/6
Stout Sheet-iron Dirt Box, Black ...	6/6	7/6
Ditto Galvanized...	8/6	9/6

Clear Opening in inches	20	22
Diameter of Base ..	30 × 30	31 × 31
With Elm Blocks, with or without vent openings	53/-	60/-
Cast-iron Top, with or without vents	40/-	47/6
Stout Sheet-iron Dirt Box, Black ...	8/6	9/6
Ditto Galvanized...	11/6	12/6

Fig. 31.—MANHOLE COVER AND VENT COMBINED.

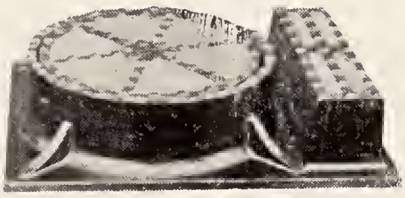


Fig. 31.

Opening in inches ..	15	18
Base in inches	26 × 15	36 × 24
If Elm Blocks	45/-	55/-
If Cast Top, plain	35/-	45/-

Fig. 32.—OVAL MANHOLE COVERS.

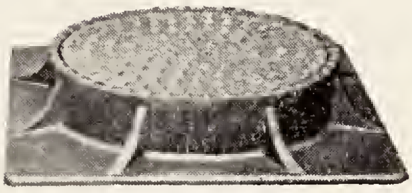


Fig. 32.

Opening in inches ..	19 × 15	21 × 16
Base in inches	29 × 23	33 × 28
If Elm Blocks, with or without vents	42/-	52/6
If Cast Top, with or without vents	32/6	37/6
Ditto, for Concrete Filling ...	32/6	37/6
Dirt Box, Black	8/6	9/6
Ditto, Galvanized	11/6	12/6

Fig. 33.—MANHOLE OR LAMPHOLE COVER,

With Circular Base.

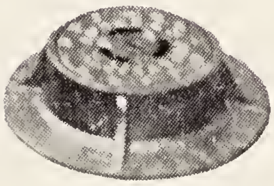


Fig. 33.

Opening in inches	10	12	15
Base in inches ..	17	21	24
If Elm Blocks, with or without vent openings	20/-	25/-	30/-
If no Elm Blocks, do. do. ...	12/6	17/6	23/-
Strong Wrought Dirt Box, Black	5/-	6/-	6/6
Do. do. Galvanized ...	6/6	8/-	8/6

Opening in inches	18	20	22
Base in inches ..	28	30	32
If Elm Blocks, with or without vent openings	37/6	45/-	55/-
If no Elm Blocks, do. do. ...	30/-	37/6	46/-
Strong Wrought Dirt Box, Black	7/6	8/6	9/6
Do. do. Galvanized ..	9/6	11/6	12/6

Manhole Covers, etc.

Fig. 42.—HEAVY RECTANGULAR MANHOLE COVER.

Not hinged, for road traffic. A similar Cover (42A), all cast, for paths and lighter traffic.

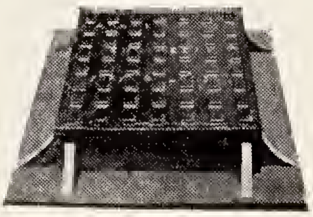


Fig. 42.

Opening.	With or without Vents.	With Wood Blocks.	Fig. 42A. for Lighter traffic, all cast.	Wrought Iron Dirt Box.	Galvanized Dirt Box.
12 in. × 12 in.	—	—	12/6	5/-	7/6
$13\frac{1}{2}$ in. × $13\frac{1}{2}$ in.	30/6	—	—	6/6	8/6
15 in. × 15 in.	—	—	15/6	—	—
18 in. × 18 in.	36/-	43/-	21/6	8/6	11/6
20 in. × 20 in.	—	—	26/-	—	—
24 in. × 24 in.	50/-	65/-	35/-	10/-	13/-
24 in. × 32 in.	62/6	82/-	—	12/6	17/-
32 in. × 32 in.	70/-	95/-	—	14/-	18/6

Fig. 43A.—STRONG RECTANGULAR HINGED MANHOLE COVERS. ADMIRALTY PATTERN.

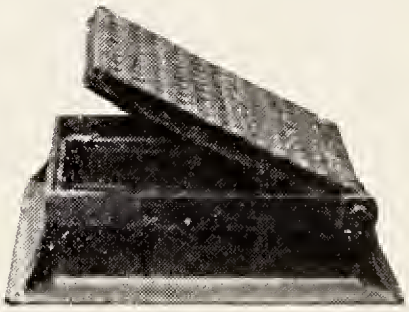


Fig. 43A.

	In.		In.	£	s.	d.	Wrought Dirt Box, Black.
Clear Opening	24	×	17	2	0	0	7/6
,, ,,	30	×	24	3	0	0	10/-

With or without Ventilating openings. Lock and Key, if required, 2/6 extra.

Prices include Cast-iron Dirt Tray.

Fig. 44.—RECTANGULAR VENT SHAFT COVER,

With Hinged Lid, Dirt Box cast in, and opening for insertion of sanitary pipe at base.

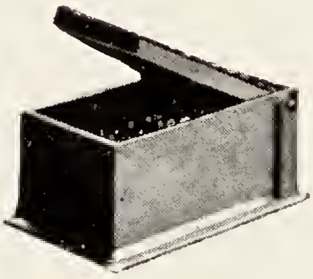


Fig. 44.

For Shaft of diameter in inches of	In. 6	In. 9	In. 12
Size of Lid	19 × $9\frac{1}{2}$	26 × 23	31 × 14
,, Base	20 × 11	28 × 15	33 × 16
Depth	$9\frac{1}{2}$	$11\frac{1}{2}$	16
Price	25/-	40/-	50/-
If extra strong, add	5/-	7/6	10/-
,, lock ,,	1/6	1/6	1/6

STEP IRONS.

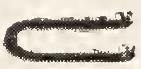


Fig. 35.

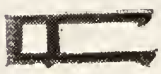


Fig. 36.

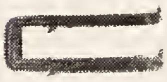


Fig. 37.

Wrought Black	1/8 each
Cast Black	1/- ,,
,, heavy	1/3 ,,
Malleable Cast Black, unbreakable	1/- ,,
,, Galvanized	1/6 ,,

☞ *See on for Airtight Covers, Electric Covers, etc.*

Manhole and Lamphole Covers, etc.

Fig. 68.—STRONG RECTANGULAR MANHOLE COVER.

Hinged (not air-tight), and vented or not, as required.

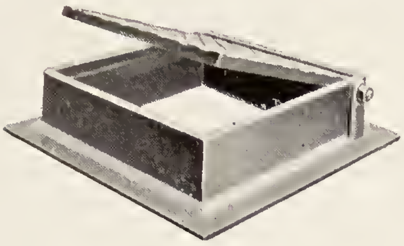


Fig. 68.

Opening, Inches.		Base, Inches.		Depth, Inches.		Price, Black.		Same Cover, but not hinged, 68A.
12 × 12	...	17 × 17	...	3	...	0 15 6	...	0 14 0
15 × 15	...	19 × 19	...	3	...	1 0 0	...	0 18 0
18 × 18	..	24 × 24	...	3	...	1 5 0	...	1 3 0
20 × 20	...	26 × 26	...	3	...	1 10 6	...	1 8 0
20 × 20	...	28 × 28	...	5	...	1 12 6	...	1 10 0
24 × 24	...	32 × 32	...	5	...	1 18 6	...	1 16 6
30 × 26	...	39 × 33	...	5½	...	2 15 0	...	— —
32 × 32	...	44 × 44	...	6	...	3 12 6	...	— —
48 × 48	...	58 × 58	...	6	...	5 15 0	...	— —

Lock and Key extra, 1/6.

Chequered Wrought Iron Doors or Dirt Boxes, if desired.

Fig. 70.—SIDE ENTRANCE COVERS AND SAFETY GRATES.

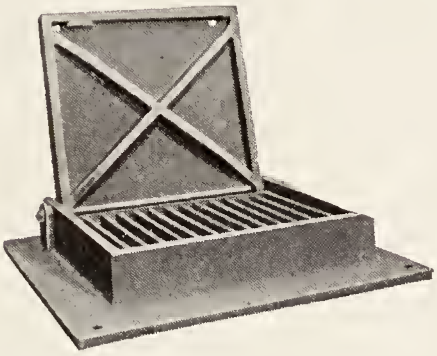


Fig. 70.

Same Cover as above, but with Wrought Grating.

Size Opening.			Price.
20 × 20 in.	...	...	£2 5 0
24 × 24 in.	...	...	2 10 0
30 × 26 in.	...	...	3 10 0

and upwards.

Prices Galvanized or to Special Sizes on application.

Fig. 71.—COVER FOR BACK PRESSURE.

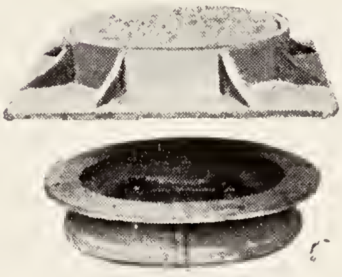


Fig. 71.

To prevent escape of sewage to surface in case of floods.

The lower cover has a machined lid, and a rubber washer attached, and is drawn up to that above by bolts on cross-bar.

Size.			Price.
19 × 15 in.	...	...	£5 10 0
21 × 15 in.	...	...	6 10 0

ADAMS' PATENT MANHOLE COVER,

In which a chemical block is used as a deodoriser.

(The same arrangement is also used in conjunction with Vent Covers Fig. 44, shewn page 130.)

Clear Opening.		With Wood Blocks.		No Wood Blocks.		Chemical Refills.
22 in.	...	£5 10 0	...	£5 0 0	...	7/6
20 in.	...	5 0 0	...	4 10 0	...	6/6
18 in.	...	4 5 0	...	3 17 6	...	5/6
15 in.	...	3 5 6	...	3 0 0	...	4/6

☞ *See on for Airtight Covers, Electric Covers, etc.*

Electric Light Covers, etc.

Fig. 61.—ELECTRIC LIGHT COVERS

For stone, cement, or ashphalte.

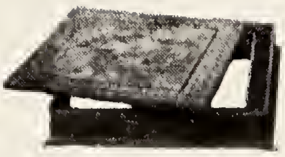


Fig. 61.

Opening. Inches	Base. Inches	Depth. Inches	For Stone.	For Concrete.	If fitted with Stone
12 × 12	16 × 16	3	20/-	22/6	
18 × 18	—		27/6	30/-	Prices upon application
21 × 21	28 × 28	5	32/-	35/-	
23 × 24	32 × 32	5	37/6	40/-	

Fig. 62.—OBLONG COVER AND FRAME.

Fig. 62.

Opening. Inches	Base. Inches	Depth. Inches	For Stone.	For Concrete.	If fitted with Stone
18 × 24	22 × 28	3	40/-	47/6	Prices upon application
23 × 27	33 × 36	3	50/-	57/6	

Fig. 63.--ADAMS' PATENT SELF-DRAINING JUNCTION BOX COVER. (See also Fig. 65.)

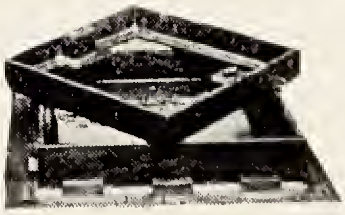


Fig. 63.

Opening. Inches	Base. Inches	Depth. Inches	For Stone.	For Concrete.	If fitted with Stone.
17 × 17	26 × 26	4½	30/-	32/-	
21½ × 21½	30 × 30	5	35/-	38/6	Prices upon application
25 × 25	35 × 35	4½	40/-	47/6	
36 × 36	48 × 38	5½	66/-	70/-	

This Cover prevents ingress of outside water, or water due to condensation. The slots shewn in frame allow it to pass away on outside rather than inside of Cover.

Fig. 64.—AIR-TIGHT COVER AND FRAME.

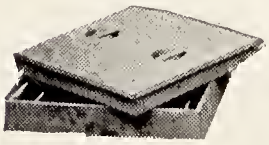


Fig. 64.

Opening. Inches	Base. Inches	Depth. Inches	Price.
12 × 12	16 × 16	3	21/-
21 × 21	28 × 28	5	37/6
23 × 23	32 × 32	5	45/-
28 × 40	— —	5	57/6

Locks and Keys for any of the above, if required, 2/6 extra

Note.—Prices given for Galvanized upon application, and for Covers with Reversed Flanges, Specials, &c,

☞ *See on for Airtight Covers, Electric Covers, etc.*

Electric Light Covers, etc.

Fig. 65.—ADAMS' PATENT SELF-DRAINING JUNCTION BOX COVER.

This Cover has a deep frame, which is overlapped by its sockets; openings are provided in the latter that the water of condensation or leakage may pass away on outside rather than inside of chamber.

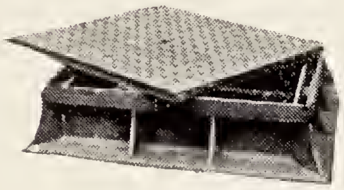


Fig. 65.

Opening.	Base.	Depth.	Price
23 in. × 23 in.	31 in. × 31 in.	7 in.	45/-

Lock and Key, 2/6.

Fig. 66.—HEAVY AIR-TIGHT HINGED COVER.

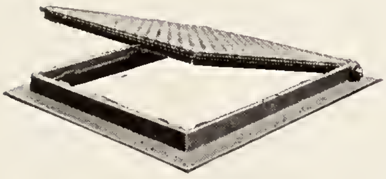


Fig. 66.

Opening.	Base.	Depth.	Price
12 in. × 12 in.	10 in. × 19 in.	2½ in.	20/-
15 in. × 15 in.	25 in. × 25 in.	4½ in.	27/6
14 in. × 15 in.	22 in; × 22 in.	2½ in.	22/6
16 in. × 17 in.	24 in. × 24 in.	3 in.	32/6
21 in. × 21 in.	32 in. × 32 in.	5 in.	42/6
18 in. × 23 in.	25 in. × 30 in.	3½ in.	41/6
24 in, × 23 in.	30 in, × 30 in.	3 in.	45/-
24 in. × 24 in.	36 in. × 38 in.	4 in.	48/6
36 in. × 37 in.	50 in. × 50 in.	5 in.	70/-

Lock and Key, 2/6.

Fig. 67.—SPECIAL STRONG AIR-TIGHT COVERS.

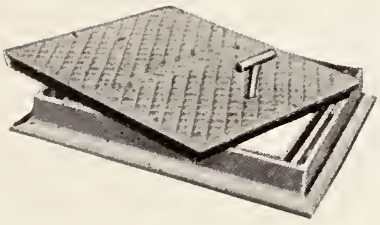


Fig. 67.

Opening.	Base.	Depth.	Price. Black.	Price. Galv.	*Ex.* Strong for Heavy Traffic
12 in. × 12 in.	———	—	17/6	30/-	—
15 in. × 15 in.	22 in. × 22 in.	3 in.	20/-	37/6	—
18 in. × 18 in.	30 in. × 30 in.	4 in.	30/-	47/6	50/-
20 in. × 20 in.	———	—	32/6	—	—
21 in. × 21 in.	32 in. × 32 in.	4 in.	35/-	52/6	57/6
22 in. × 13 in.	32 in. × 23 in.	4 in.	28/6	—	—
24 in × 18 in.	34 in. × 28 in.	4 in.	40/-	57/6	—
24 in. × 24 in.	———	—	45/-	65/-	—
26 in. × 26 in.	34 in. × 34 in.	4½ in.	48/6	—	—
27 in. × 23 in.	36 in. × 33 in.	4 in.	55/-	67/6	—
32 in. × 18 in.	40 in. × 26 in.	4 in.	55/-	—	—
32 in. × 32 in.	44 in. × 44 in.	4 in.	65/-	—	75/-
32 in. × 24 in.	40 in. × 32 in.	4 in.	58/6	—	—
36 in. × 24 in.	45 in. × 33 in.	4 in.	68/-	—	—
45 in. × 45 in.	54 in. × 54 in.	4 in.	—	—	100/-

Locks and Keys extra, if required, 2/6. All Covers are blacked with non-rusting solution, unless otherwise ordered. Prices for galvanizing upon application.

☞ *See on for Airtight Covers, Electric Covers, etc,*

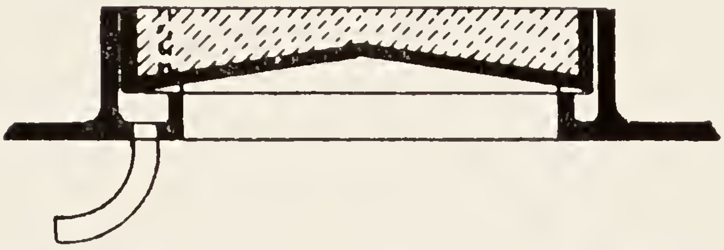
Electric Lighting and Junction Box Covers, etc.

WITH AND WITHOUT "HELORF" LEVERS.

Fig. 60.—SPECIAL JUNCTION BOX COVERS,

For cement or other filling material. Ventilated or not, as required. Water of condensation, etc., passes out to drain from pipe shewn.

Fig. 60.

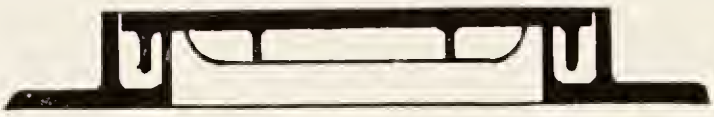


PRICES.

Opening.		Coated. £	s.	d.		With "Helorf" Levers. £	s.	d.
21-in. × 21-in.	...	2	0	0	...	2	10	0
24-in. × 18-in.	...	2	10	0	...	3	2	6

Fig. 67.—EXTRA STRONG AIR-TIGHT COVER.

Fig. 67.



PRICES.

Opening.			Coated. £	s.	d.
15-in. × 15-in.	...	...	1	1	6
18-in. × 18-in.	...	...	1	10	6
21-in. × 21-in.	...	...	1	15	0
22-in. × 13-in.	..	...	1	10	0
24-in. × 18-in.	...	...	2	0	0

24-in. × 18-in.	G.P.O. Galvanized	...	...	£3	0	0
24-in. × 18-in.	"Helorf" Levers	...	...	£3	12	6
27-in. × 23-in.	G.P.O. Galvanized	...	...	£3	10	0
27-in. × 23-in.	"Helorf" Levers	...	...	£4	5	0

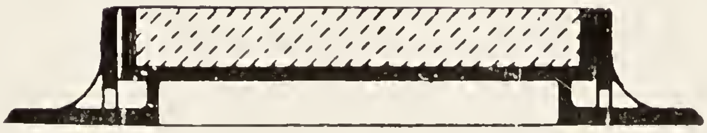
Other sizes see page 133.

This Cover may be hinged, if required.

Fig. 63.—ADAMS' PATENT SELF-DRAINING JUNCTION BOX COVER,

For preventing ingress of outside water.

Fig. 63.



PRICES.

Opening.		Coated. For Stone filling. £	s.	d.		For Concrete or other filling. £	s.	d.
21-in. × 21-in.	...	1	15	0	...	2	0	0
24-in. × 18-in.	...	2	2	6	...	2	7	6
25-in. × 25-in.	...	2	5	0	...	2	10	6
36-in. × 36-in.	...	3	7	6	...	3	15	0

If fitted with stone, prices upon application.

☞ See also Fig. 65, page 133.

Special Manhole Covers, etc.

ADAMS' PATENT "HELORF."

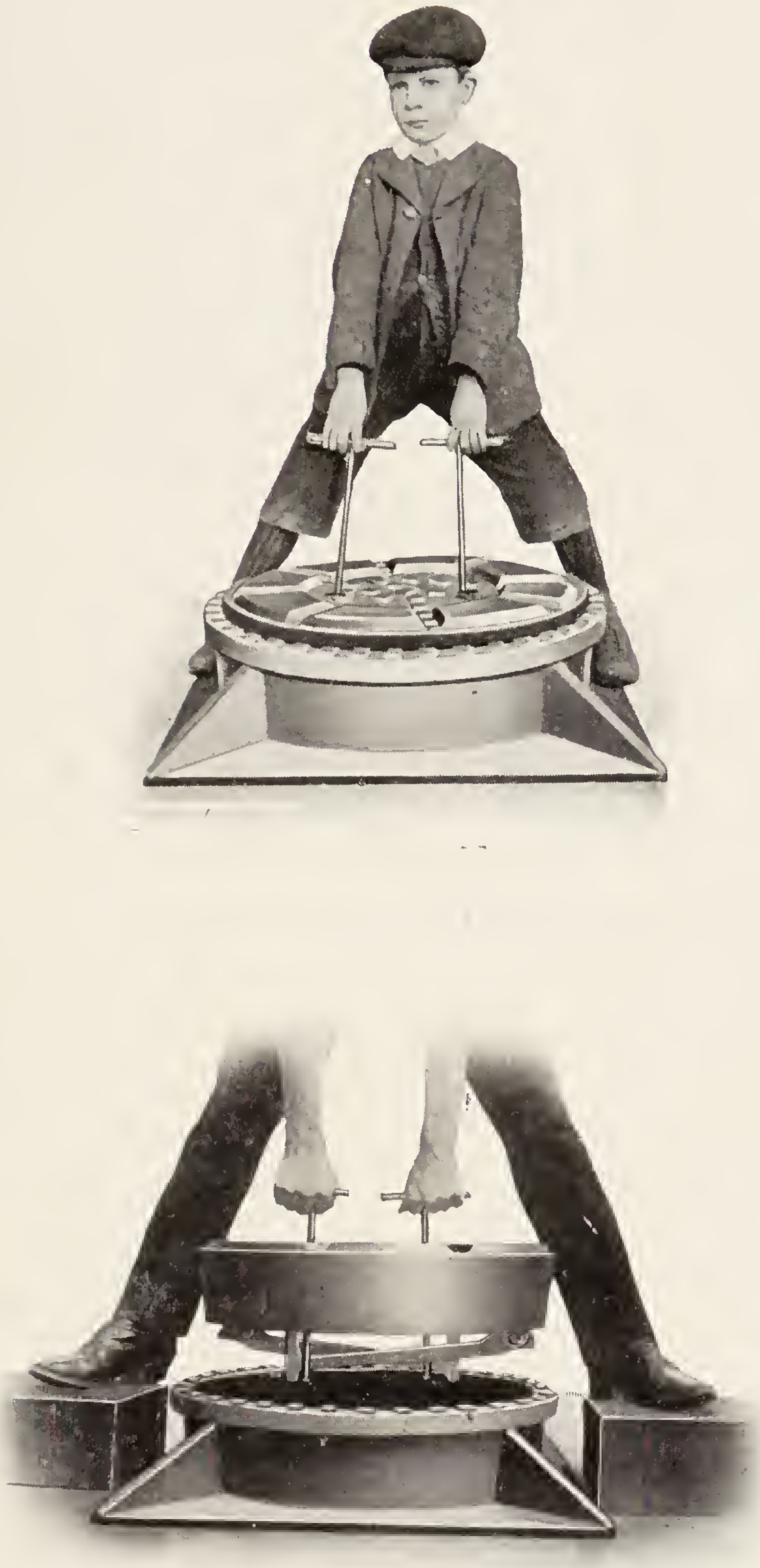


Fig. 300.

THE difficulty in opening an ordinary heavy Manhole Cover is well known; it is frequently almost impossible to open such covers. The 'Helorf' Covers are fitted with one or more cross levers so arranged that when drawn up by means of a hook-key, the plug of the Manhole Cover is raised from its seating. When thus started it may be readily lifted entirely out. The boy in the picture is supporting the whole weight of the plug by means of the levers—the man below is supporting the entire dead weight of the plug without the levers. The difference in effort is apparent.

PRICES.

Strong circular cover, with square base.

Clear Opening in inches	18-in.	20-in.	22-in.
Diameter of base	28×28	30×30	31×31
Cast-Iron Top, with or without Vents	38/6	47/6	54/-
If with Elm Blocks	48/6	58/-	65/-
Stout Dirt Box for ditto	7/6	8/6	9/-

Special Manhole Covers, etc.

ADAMS' PATENT "HELORF."

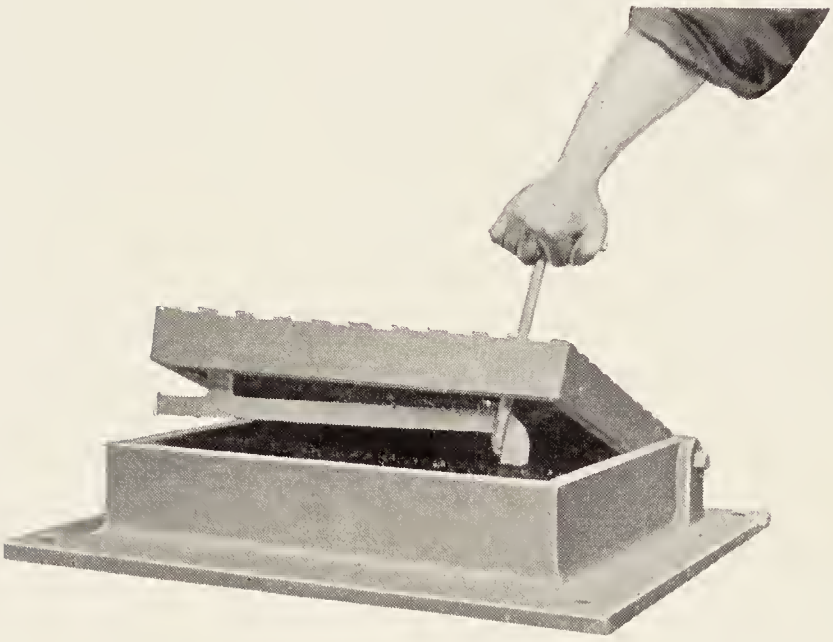


Fig. A.

As will be seen this cover is fitted with a "Helorf" Lever, as described on other side. One cross lever only is used; it serves to start the hinged cover, which is then drawn open by the same key. The cover is suitable for ordinary road traffic. It may be fitted with drop-in lid if desired. The cover may be had with or without levers.

PRICES.

Vents or not, as required.

	With "Helorf" Levers.			Without Levers.		
	£	s.	d.	£	s.	d.
18-in. × 18-in.	1	11	0	1	5	0
20-in. × 20-in.	2	2	6	1	15	6
24-in. × 17-in.	2	7	6	2	0	0
30-in. × 24-in.	3	10	0	3	0	0

Dirt Box ... 8/6 10/6 12/6.

Fig. B.—HEAVY AIR-TIGHT COVER.

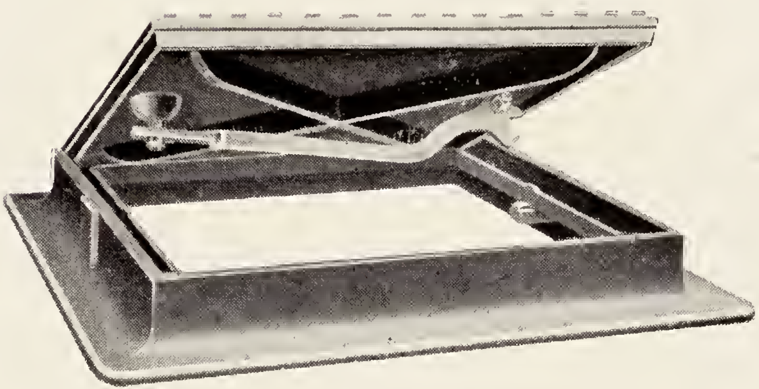


Fig. B.

This is fitted with sand joint and drop-in lid. The one "Helorf" Lever serves in this case to raise the lid, and also as a lock. The key being turned when cover is down, prevents lever rising and keeps its catch in the locked position.

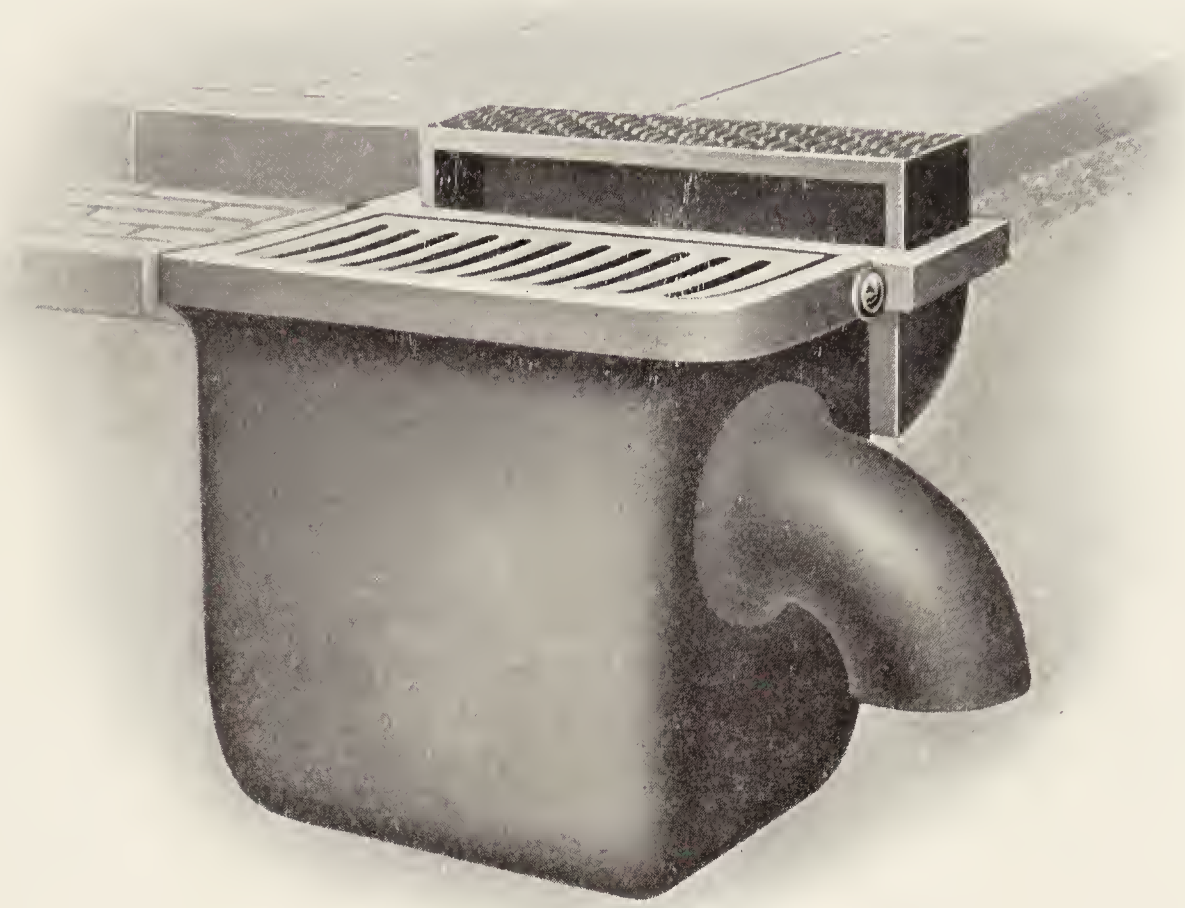
PRICES.

		With "Helorf" Levers.				Without Levers.			Light Painted.
		£	s.	d.		£	s.	d.	
18-in. × 18-in.	...	1	17	6	...	1	11	6	—
21-in. × 21-in.	...	2	10	0	...	2	2	6	40/-
24-in. × 18-in.	...	2	10	0	...	2	1	6	41/6
24-in. × 18-in.	Galvd.	3	12	6	G.P.O.	3	0	0	—
27-in. × 23-in.	...	4	5	0	...	3	10	0	—

☛ *See on for Airtight Covers, Electric Covers, etc.*

Gullies, Stable Traps, etc.

BROWN'S PATENT GULLY.



DESIGNED by J. W. Brown, Esq., M.I.C.E., (more than 20 years Borough Engineer of West Hartlepool) to suit his own requirements—provides all the essential features of a good gully, namely, an ample trap, ready inspection to drain, and a sufficient storage capacity—above all it is so constructed with a storm weir that, in the event of chokage of the gratings, or of an abnormal flow, the overflow comes into operation and prevents the possibility of the roadway becoming flooded. The gullies are made in iron and in strong fireclay. The kerbs have a standard depth of 4 in. or 5 in.

State that required when ordering.

PRICES,

Complete in Iron or Fireclay.

				£	s.	d.
No. 1	... 14-in. × 10-in. × 18-in. deep	... 4-in. outlet	...	2	7	6
2	... 20-in. × 14-in. × 24-in. ,,	... 6-in. ,,	...	2	18	0

Hinge or Drop-in Grating as ordered.

Gullies, Stable Traps, etc.

Fig. 49.—HINGED GULLY GRATE.

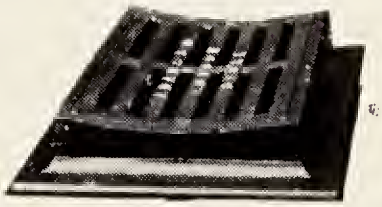


Fig. 49.

	In. In.	In. In.	In. In.	In. In.
Size of Opening ...	7 × 8	8 × 9½	9 × 10	10½ × 10½
Price	9/6	10/6	11/6	12/6

If extra heavy ... 19/6

	In. In.	In. In.	In. In.	In. In.	In. In.
Size of Opening	12 × 12	14 × 14	18 × 18	20 × 20	24 × 24
Price	17/6	19/6	25/-	35/-	45/-

	In. In.	In. In.	In. In.	In. In.
Or Fig. 49A, with Lid to drop in	8 × 12	11 × 16	16 × 22	16 × 21
	12/-	15/-	16/6	17/6

Fig. 50.—STREET GULLY AND YARD TRAP.

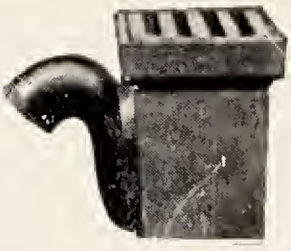


Fig. 50.

Double Trap, with removable Dirt Bucket.

Specially good for stable use.

Top.		Outlet.		Depth.		Price.
11 in. × 8 in.	...	3 in.	...	10½ in.	...	15/-
14 in. × 10 in.	...	3 in.	...	12 in.	...	20/-
20 in. × 14 in.	...	4½ in.	...	15 in.	...	40/

Fig. 51.—ROUND GULLY,

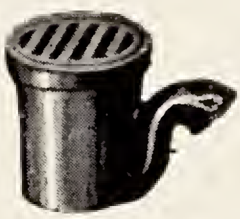


Fig. 51.

Of similar internal construction as above.

Diameter.	Outlet.	Depth.	Price.
8 in.	2½ in.	9½ in.	12/-
10 in.	3 in.	11 in.	15/-

Dirt Box ... 1/3 and 1/6.

Fig. 52.—ADAMS' PATENT SWIVEL GULLY.

May be set square to wall or path, etc., and outlet turned to meet drain, avoiding bends, and giving straight lead for inspection.

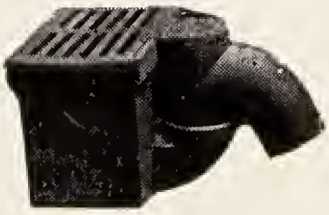


Fig. 52.

Top.	Depth.		Outlet.		Price.
8 in. × 11 in. ×	10 in.	...	3 in.	...	20/-
10 in. × 14 in. ×	12 in.	...	3 in.	...	25/-
10 in. × 14 in. ×	12 in.	...	4½ in.	...	32/6
14 in. × 20 in. ×	15 in.	...	4½ in.	...	45/-

Ventilating Columns.

STRONG, cast-iron base, about 3 ft. under ground, with Flange for attachment to foundation. Cast-iron extension to 4 ft. above ground, and stout-welded tube extension pipe, surmounted by cowl.

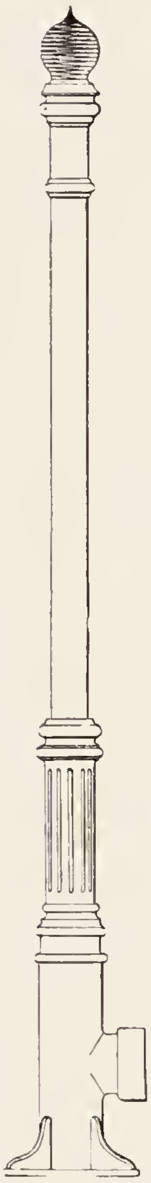


Fig. 1.

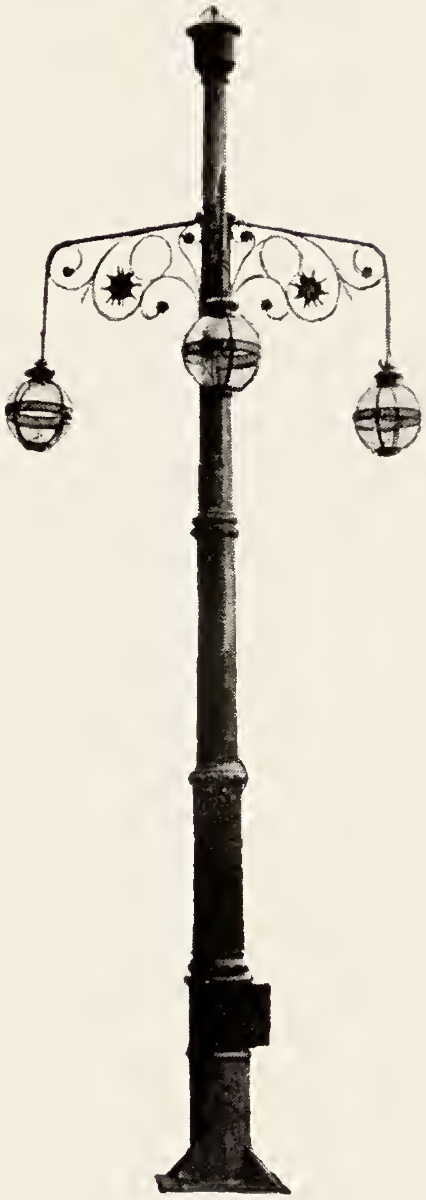


Fig. 3.

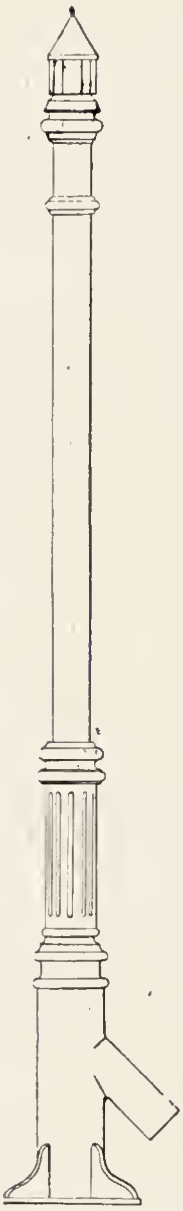


Fig. 2.

Fig. 1 (WITH WIRE COWL).

	15 ft.	20 ft.	25 ft.	30 ft.	If Fixed Cowl.	If Revolving Cowl.
4 in. dia.	£4 17 6	£6 0 0	£7 5 0	£8 10 0	7/6	30/-
6 in. ,,	7 0 0	8 0 0	9 0 0	10 0 0	9/6	25/-

When ordering, state which type of sewer connection desired, whether as Fig. 1 or Fig. 2.

Fig. 3.—HEAVY ORNAMENTAL CAST COLUMN,

With or without Lamps, and locked door for insertion of Adams' Patent Deodoriser or Oil or Gas Jet, etc. Prices upon application.

☛ The Deodoriser described on page 39 may be used in conjunction with these vent columns

USEFUL MEMORANDA.

MENSURATION OF AREAS.

Diameter of a circle × 3·1416 = circumference. Side of a square to be drawn inside a circle = diameter × ·7071.

Diameter of a circle squared × ·7854 = area. Side of a square of equal area to given circle = circumference × ·2821.

Circumference × ·31834 = diameter. Side of a square being known, the diameter of circle enclosing it = given side × 1·4142.

Circumference squared × ·07958 = area. Diameter of circle equal in area to the square = given side × 1·128.

Circumference of an ellipse or oval. Add length and breadth and × 1·5708 (simple approximate rule).

Area of an ellipse. Multiply the two diameters together and product × .7854.

ENGLISH AND METRIC MEASURES, ETC.

MEASURES OF LENGTH.

To convert metres into feet × 3·2809.
,, centimetres into inches × 0·3937.
,, feet into metres × 0·3048.
,, inches into centimetres × 2·5400.

MEASURES OF CAPACITY.

To convert gallons to litres × 4·543.
To convert litres into gallons × .22.

AIR.

The mean pressure of the atmosphere at sea level is 14·7 lbs. per square inch (= one atmosphere) = a column of air at 32° F. 27,801 feet high or about 5¼ miles of uniform density = a column of mercury 29·922 inches high at 32° F., and 30 inches high at 62° F. = a column of water at 62° F. 33·947 feet.

Volume is inversely as the pressure.

Each degree Farenheit = an addition to volume $\frac{1}{461}$ about.

WATER—EQUIVALENTS, ETC.

	Lbs.	Cwts.	Tons.	Cub. inches.	Cub. ft.	Gallons.	Litres.	Cub. metres.	Kilo.
1 cubic foot of water =	62·425	·557	·028	—	—	6·24	28·375	·0284	—
1 ,, inch ,, =	·03612	—	—	—	—	·0036	—	—	—
1 cwt. ,, =	—	—	—	—	1·8	11·2	—	—	—
1 ton ,, =	—	—	—	—	35·9	224	1000 about	1·00 about	—
1 pound ,, =	—	—	—	27·72	—	·10	—	—	·4537
1 gallon ,, =	10·00	—	—	277·274	·16	—	4·537	—	—
1 cubic metre ,, =	(about 1 ton, or 1·308 cub. yds.)				35·31	220	—	—	1000

PRESSURE, ETC.

Head in feet = 2·306 × pressure in pounds per square inch.
,, ,, = 0·0160 × ,, ,, ,, foot.
Head in feet × ·4335 = pressure in pounds per square inch.
,, ,, × 62·425 = ,, ,, ,, ,, foot.
Water—cubic feet per minute × 9,000 = gallons in 24 hours.
Diameter^2 of pipe in inches = pounds of water per yard.

Useful Memoranda—*Continued.*

RAINFALL.

Inches of rain × 2,323,200 = cubic feet per square mile.
,, ,, × 14½ = millions of gallons per square mile.

HORSE-POWER REQUIRED TO RAISE WATER.

Multiply water raised in gallons per minute by ten and by height lifted in feet and divide by *33,000. Add one to two-thirds for loss due to friction and slip of valves, etc.

(*Assumed value of a horse's power working 8 hours per day.—WATT.)

Or Q = quantity of water raised per minute in cubic feet.
H = height in feet. Actual horse power = ·0023 H Q.

TO FIND THE HORSE-POWER OF AN ENGINE.

Multiply the area of piston in inches by mean pressure per square inch and by piston speed in feet per minute, divide product by 33,000, quotient being indicated H.P.

TO FIND THE HORSE-POWER OF WATER.

Multiply the cubic feet of water per minute by 62·42 (weight in lbs. of cubic foot) the result will be weight of water used per minute × by head in feet = foot pounds divided by 33,000 (the foot pounds equivalent to 1 H.P.), will give theoretical H.P.

HEAD OF WATER (IN FEET) CONSUMED BY FRICTION WITH PIPES ONE YARD LONG.

DIAMETER OF PIPE IN INCHES.

Gals. per minute.	1in.	1½in.	2in.	2½in.	3in.	4in.	5in.	6in.	9in.	12in.	15in.
1	·0041	·00054	·00012	·000042	—	—	—	—	—	—	—
4	·0658	·00867	·00205	·000674	·00027	·00006	—	—	—	—	—
8	·2633	·0346	·00823	·00269	·00108	·00025	—	—	—	—	—
10	·411	·0541	·01286	·00421	·00169	·00040	·00013	—	—	—	—
20	1·64	·2167	·0514	·01685	00677	·00160	·00052	·00021	—	—	—
40	6·58	·8670	·205	·06742	·0271	·00643	·0020	·0008	·000191	—	—
60	14·81	1·95	·463	·1517	·0609	·01446	·00474	·00190	·00045	·00005	—
80	26·33	3·46	·823	·269	·1084	·0257	·0084	·00338	·00044	·00010	—
100	41·1	5·4	1·28	·421	·169	·0401	·01317	·00529	·00069	·000165	·00005
120	59·2	7·8	1·85	·606	·243	·0578	·01896	·00762	·0010	·00023	·00007
180	133·3	17·5	4·16	1·365	·549	·1312	·0426	·01714	·00225	·00053	·00017
250	257·1	33·8	8·03	2·633	1·058	·2511	·08231	·0330	·00435	·00103	·00033
300	370.3	48·7	11·58	3·792	1·524	·3617	·11853	·0476	·0062	·00148	·000487

Thus to find the head lost by friction, multiply the length in yards by the figures given under the diameter of pipe on the line corresponding to gallons discharged per minute.

NOTE.—The above table is extracted from "Practical Hydraulics," by Thomas Box, to which work we refer our readers.

For Incrustation allow one sixth of the diameter for pipes under 6″ and 1″ for all pipes above 6″ diameter

Useful Memoranda—*Continued.*

WETTED PERIMETERS IN FEET.

Dia.	Full.	Three-fourths full.	Two-thirds full.	Half-full.	One-third full.	One-fourth full.
9in.	2·356	1·571	1·433	1·178	·923	·785
12in.	3·1416	2·095	1·911	1·571	1·231	1·047
15in.	3·927	2·618	2·389	1·964	1·538	1·309
18in.	4·714	3·221	2·854	2·357	1·860	1·493

RATES OF INCLINATION FOR VELOCITY. (WICKSTEED'S TABLE.)

Sewer.	Velocity in feet per minute.	Feet per second.	Gradient required.
4in. diameter	240	4·0	1 in 36
6in. ,,	220	3·66	1 ,, 65
8in. ,,	220	3·66	1 ,, 87
9in. ,,	220	3·66	1 ,, 98
10in. ,,	210	3·5	1 ,, 119
15in. ,,	180	3·0	1 ,, 244
18in. ,,	180	3	1 ,, 294
21in. ,,	180	3	1 ,, 343
24in. ,,	180	3	1 ,, 392
30in. ,,	180	3	1 ,, 490
36in. ,,	180	3	1 ,, 588
48in. ,,	180	3	1 ,, 784

RATES OF INCLINATION FOR VELOCITY.

Mr. Latham (Lectures on Sanitary Engineering, before the Royal Engineers at Chatham) gives the following table. (PARKES.)

Diameter of Sewer in inches.	Rate of inclination for velocity per second.				
	2 feet.	3 feet.	4 feet.	5 feet.	6 feet.
4 inch	1 in 194	1 in 92	1 in 53	1 in 34	1 in 24
6 ,,	1 ,, 292	1 ,, 137	1 ,, 80	1 ,, 51	1 ,, 36
8 ,,	1 ,, 389	1 ,, 183	1 ,, 106	1 ,, 69	1 ,, 48
9 ,,	1 ,, 437	1 ,, 206	1 ,, 119	1 ,, 77	1 ,, 54
10 ,,	1 ,, 486	1 ,, 229	1 ,, 133	1 ,, 86	1 ,, 60
12 ,,	1 ,, 583	1 ,, 275	1 ,, 159	1 ,, 103	1 ,, 72

In this table the velocity × the inclination = length of sewer to which calculation applies. Thus, a velocity of 6 feet per second in a 4 inch pipe, 6 inch × 24 = 144 feet as length of sewer.

SELF-CLEANSING BOTTOM VELOCITIES. (BEARDMORE.)

·50 feet per second = 30 feet per minute will not disturb clay with sand and stones.
·6 feet ,, = 40 feet ,, will move along coarse sand.
1 feet ,, = 60 feet ,, ,, ,, fine gravel, size of peas.
2 feet ,, = 120 feet ,, ,, ,, rounded pebbles 1in. diameter.
3 feet ,, = 180 feet ,, ,, ,, angular stones 1¾in. diameter.

Hence in a large sewer, velocity of 2½ feet per second should be obtained when one-third full; 2¾ feet when half full and 3 feet when three-quarter full. To make it self-cleansing, velocity should never be less than 2 feet per second. *(Robinson.)*

The ratio between top and bottom velocity may be taken as 3 to 5; but this is variable, depending upon depth, the difference being greater with a deep flow.

Useful Memoranda—*Continued.*

THEORETICAL VELOCITY OF WATER IN FEET PER SECOND AND GALLONS DISCHARGED.

Head in feet.	Velocity in feet.	Cubic feet discharged per minute. Area of stream = 1 inch square.	Gallons per minute per square inch of area.	Head in feet.	Velocity in feet.	Cubic feet discharged per minute. Area of stream = 1 inch square.	Gallons per minute per square inch of area.
1	8·02	3·34	21·00	10	25·36	10·02	65·40
1·5	9·82	3·84	24·00	12	27·78	11·57	72·0
2	11·34	4·73	29·40	15	31·06	12·94	80·40
2·5	12·68	5·18	32·40	20	35·86	14·95	92·40
3	13·89	5·79	36·0	25	40·12	16·71	103·20
3·5	15·00	6·33	39·60	30	43·92	18·30	113·40
4	16·04	6·68	42·0	40	50·72	21·13	131·40
4·5	17·00	7·10	44·40	50	56·71	23·61	146·40
5	17·93	7·40	46·20	60	62·12	25·87	160·80
5.5	18·8	7·77	48·60	70	67·14	27·94	173·40
6	19·64	8·18	51·00	80	71·73	29·87	183·00
6·5	20·44	8·44	52·80	90	76·10	31·68	196·80
7	21·21	8·84	54·60	100	80·00	33·40	205·20
8	22·68	9·45	58·20				

* Friction will vary to 50% more or less.

CALCULATION OF DISCHARGE FROM SEWERS.

$V = 55 \times \sqrt{D \times 2F}$

Where V = velocity in feet per minute.
D = hydraulic mean depth in feet.
F = fall in feet per mile.

Then if A = sectional area of current of fluid, V A = discharge in cubic feet per minute.

The hydraulic mean-depth is the sectional area of fluid divided by the wetted perimeter. In circular pipes this is always one-fourth the diameter. The fall in feet per mile is readily obtainable from the gradient 1 in 100 or 200, etc. (5,280 feet = 1 mile).

Thus, in a 12in. circular sewer, the hydraulic mean-depth is 3in., or 0·25 of a foot. Let the fall in feet per mile be 73, then $55 \times \sqrt{\cdot 25 \times 146} = 332$ feet per minute velocity, and for the amount discharged the sectional area of pipe running full = 0·7854 square foot, and 0·7854 × 330 = 260 cubic feet discharged per minute.

The area in feet = cubic feet in 1 lineal foot of the pipe.

HYDRAULIC MEAN-DEPTH IN CIRCULAR PIPES IN SQUARE FEET.

Dia.	Full.	Three-fourths full.	Two-thirds full.	Half-full.	One-third full.	One-fourth full.
9in.	·1875	·2263	·2183	·1875	·1396	·110
12in.	·25	·3017	·2911	·25	·1862	·1466
15in.	·3125	·3771	·3639	·3125	·2327	·1833
18in.	·3722	·3815	·3735	·3722	·2733	·2313

SECTIONAL AREAS IN SQUARE FEET.

Dia.	Full.	Three-fourths full.	Two-thirds full.	Half-full	One-third full.	One-fourth full.
9in.	·4418	·3554	·313	·2209	·1289	·0864
12in.	·7854	·6318	·556	·3927	·2292	·1535
15in.	1·227	·9873	·869	·6135	·3581	·24
18in.	1·755	1·229	1·066	·8770	·5085	·3454

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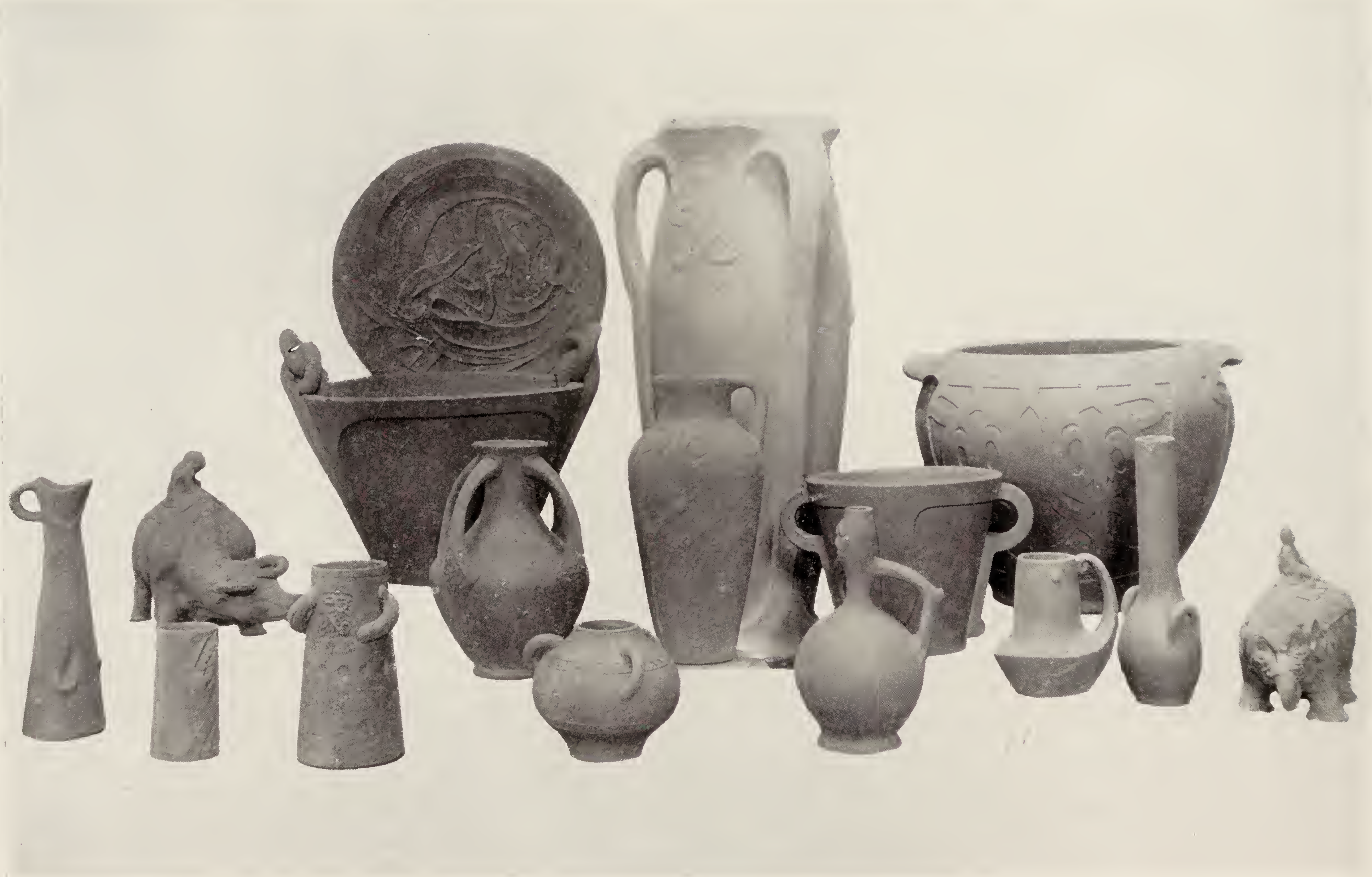

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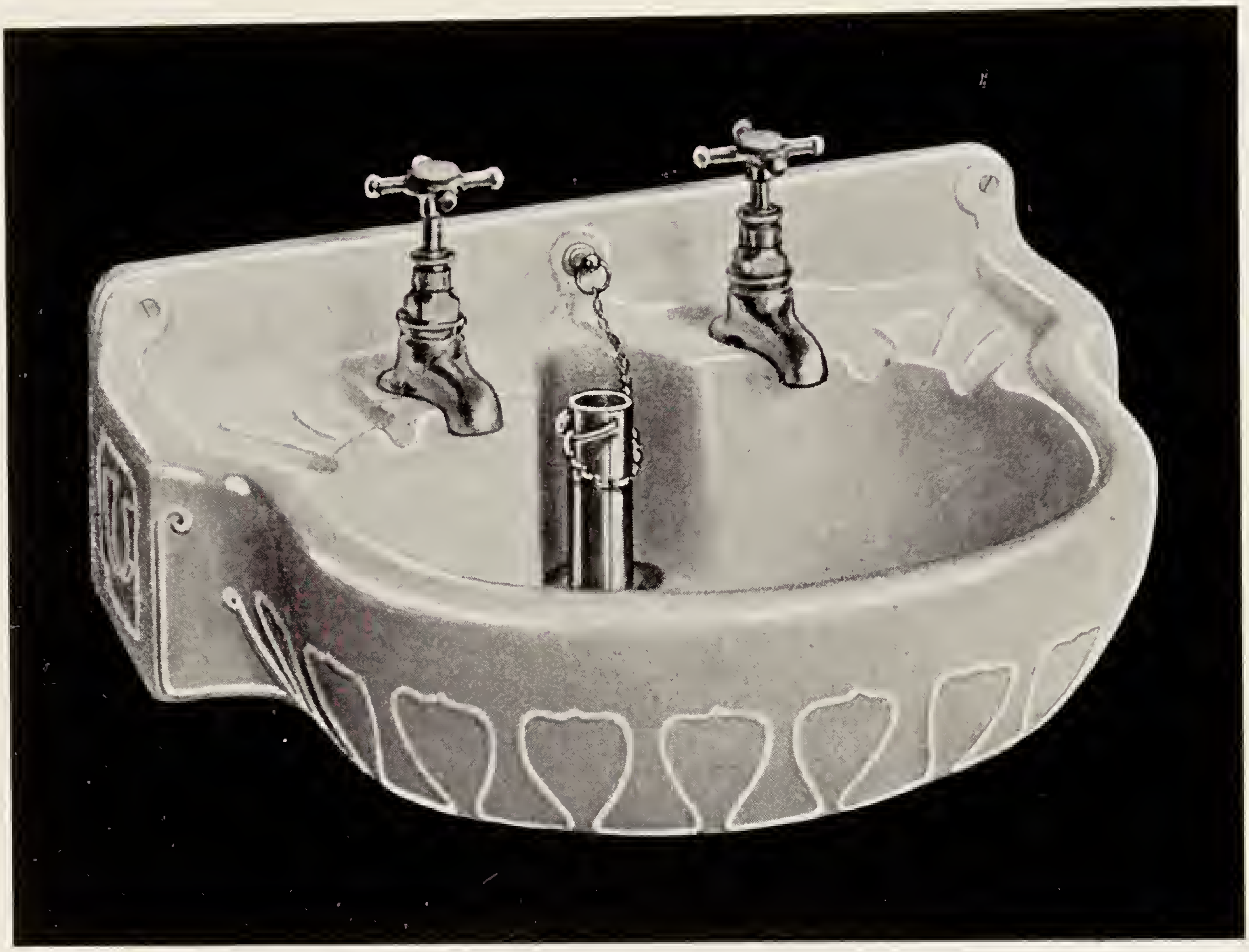

FIG. 439.

THIS BASIN IS STRONGLY RECOMMENDED FOR GOOD DOMESTIC WORK, and is made in two sizes—basin 14 in. by 11 in., slab 19 in. by 15 in.; and 18 in. by 12 in., slab 24 in. by 18 in. It requires a pair of brackets for its support; these and the screws through the skirting fix it securely. This Lavatory is also suitable for use in ranges.

See Catalogue.

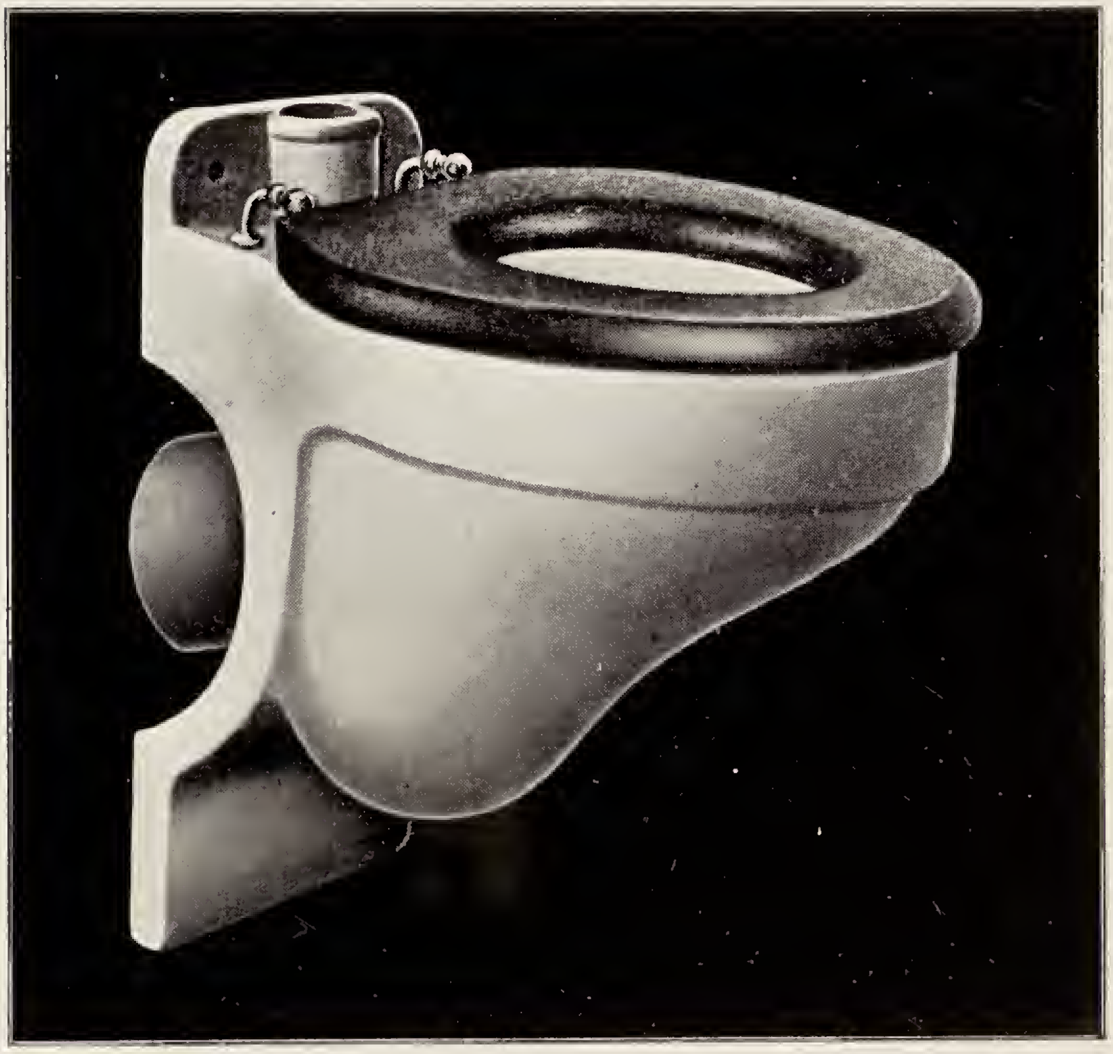

FIG. 780.

ADAMS' PATENT HOSPITAL CLOSET.

COMBINES A VISIBLE JOINT, CLEAR WASHING SPACE BELOW, AND GREAT STRENGTH.

See Sanitary Catalogue.

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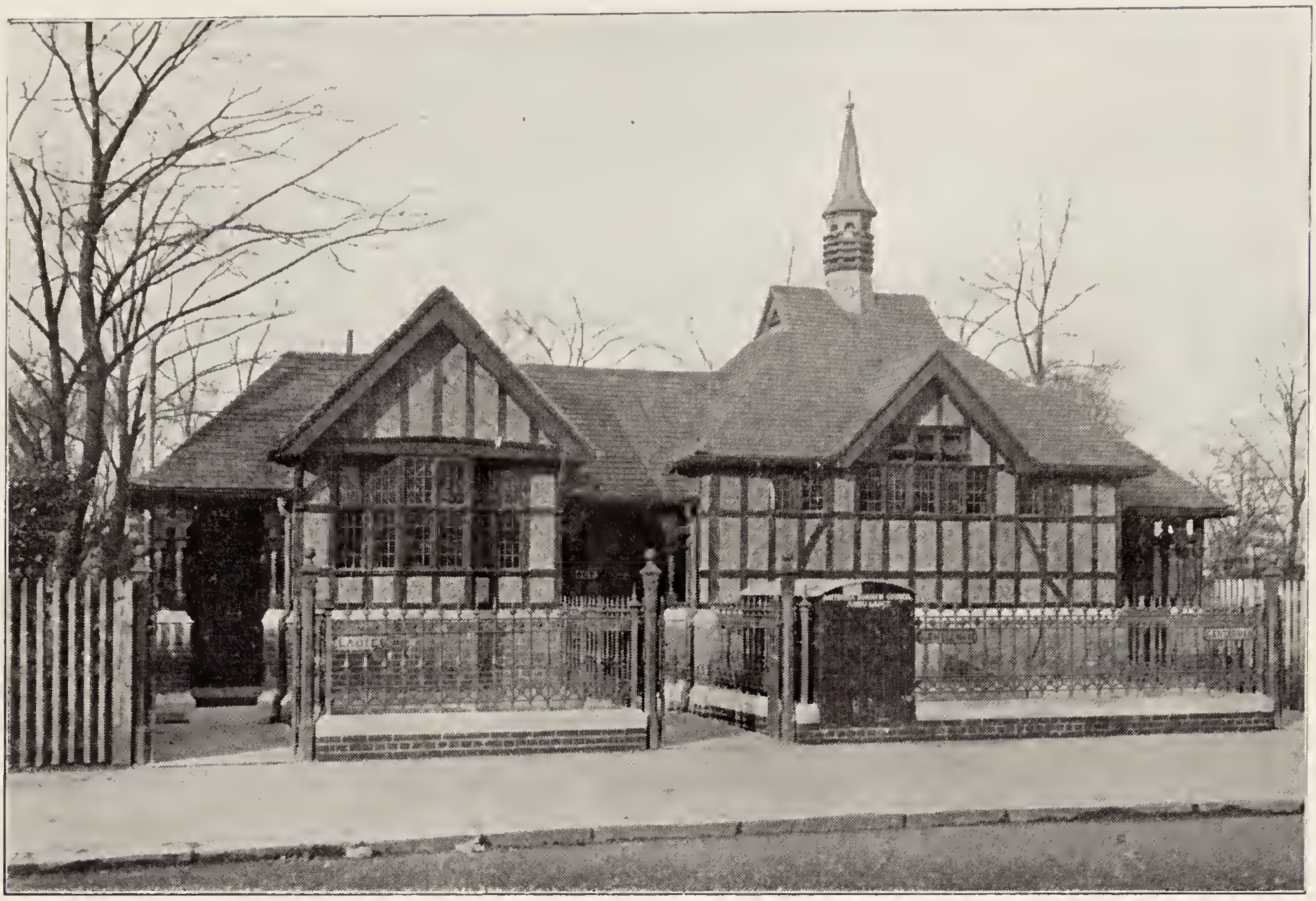
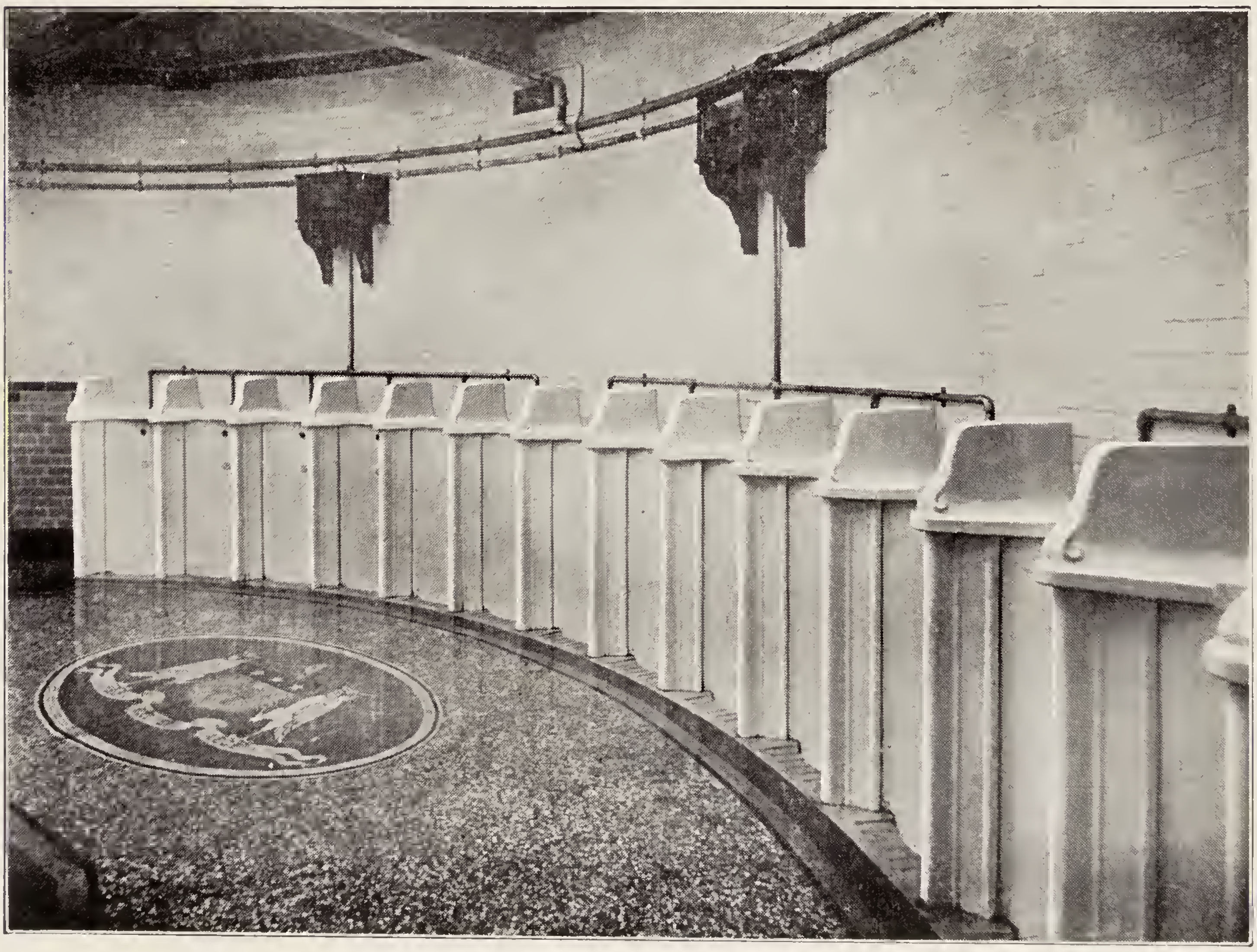


EXTERIOR OF PUBLIC CONVENIENCE, BATTERSEA.



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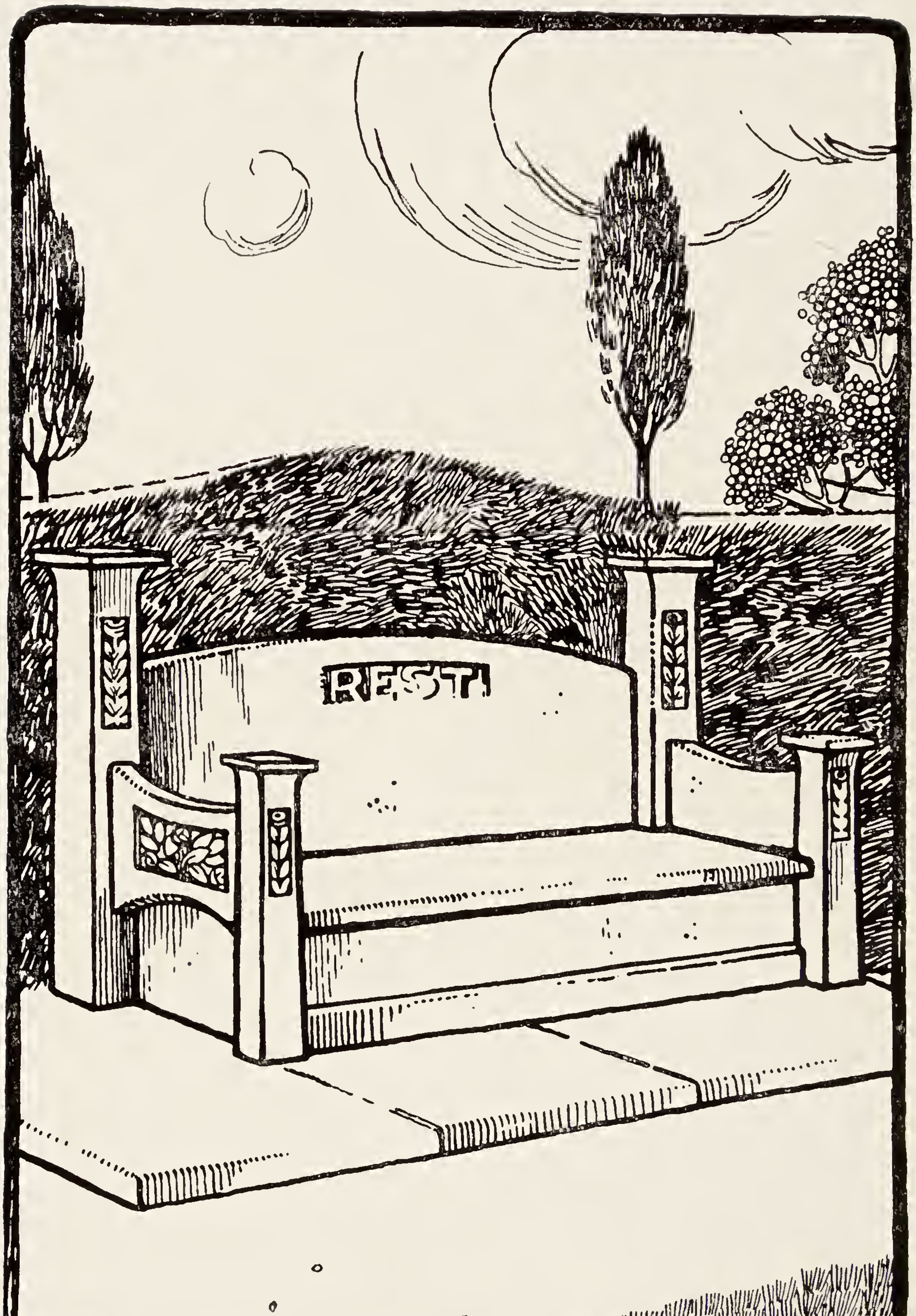

FIG. 2. A TERRA COTTA GARDEN SEAT.

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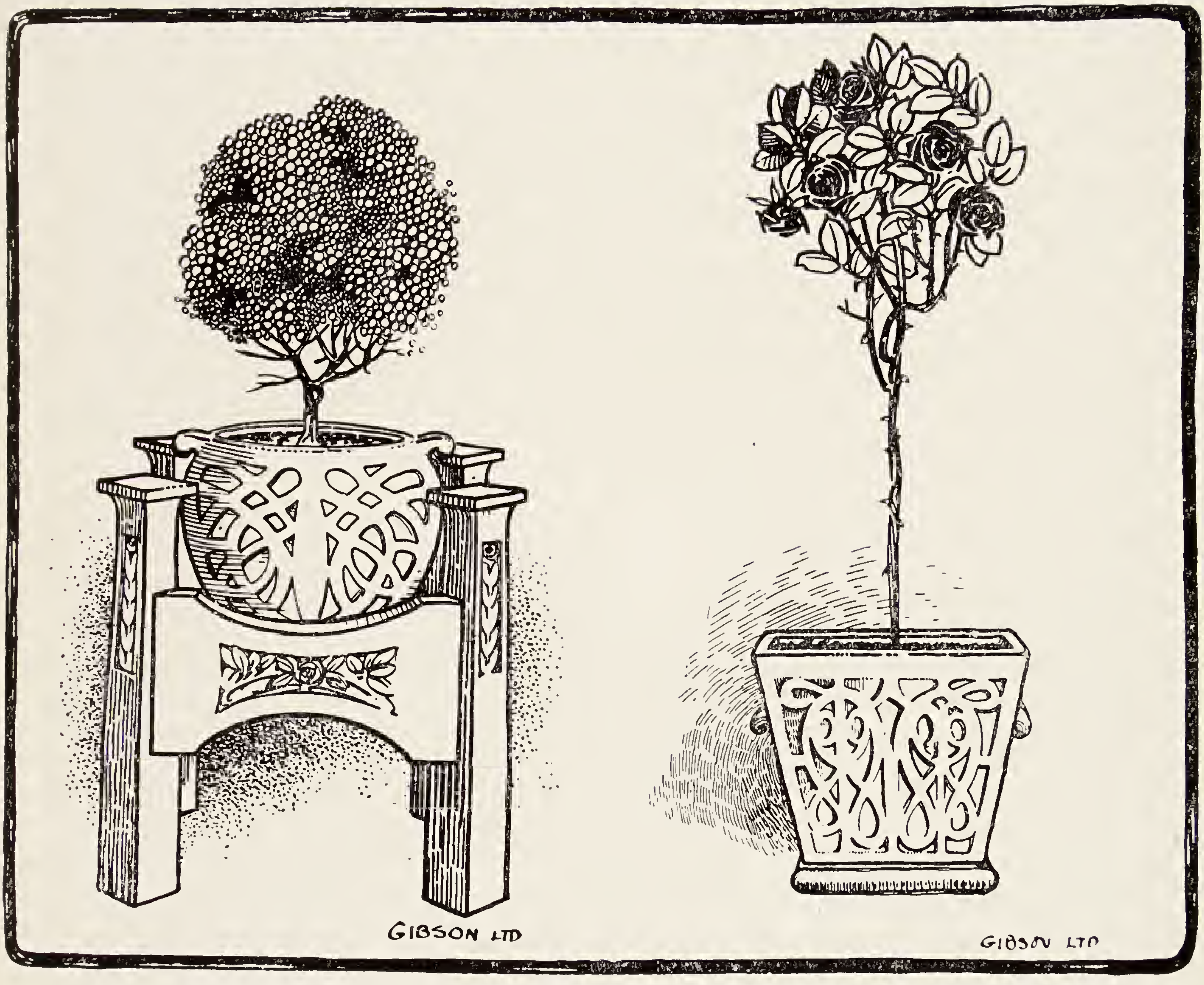

FIG. 8. FIG. 9.

TERRA COTTA GARDEN VASES, ETC.

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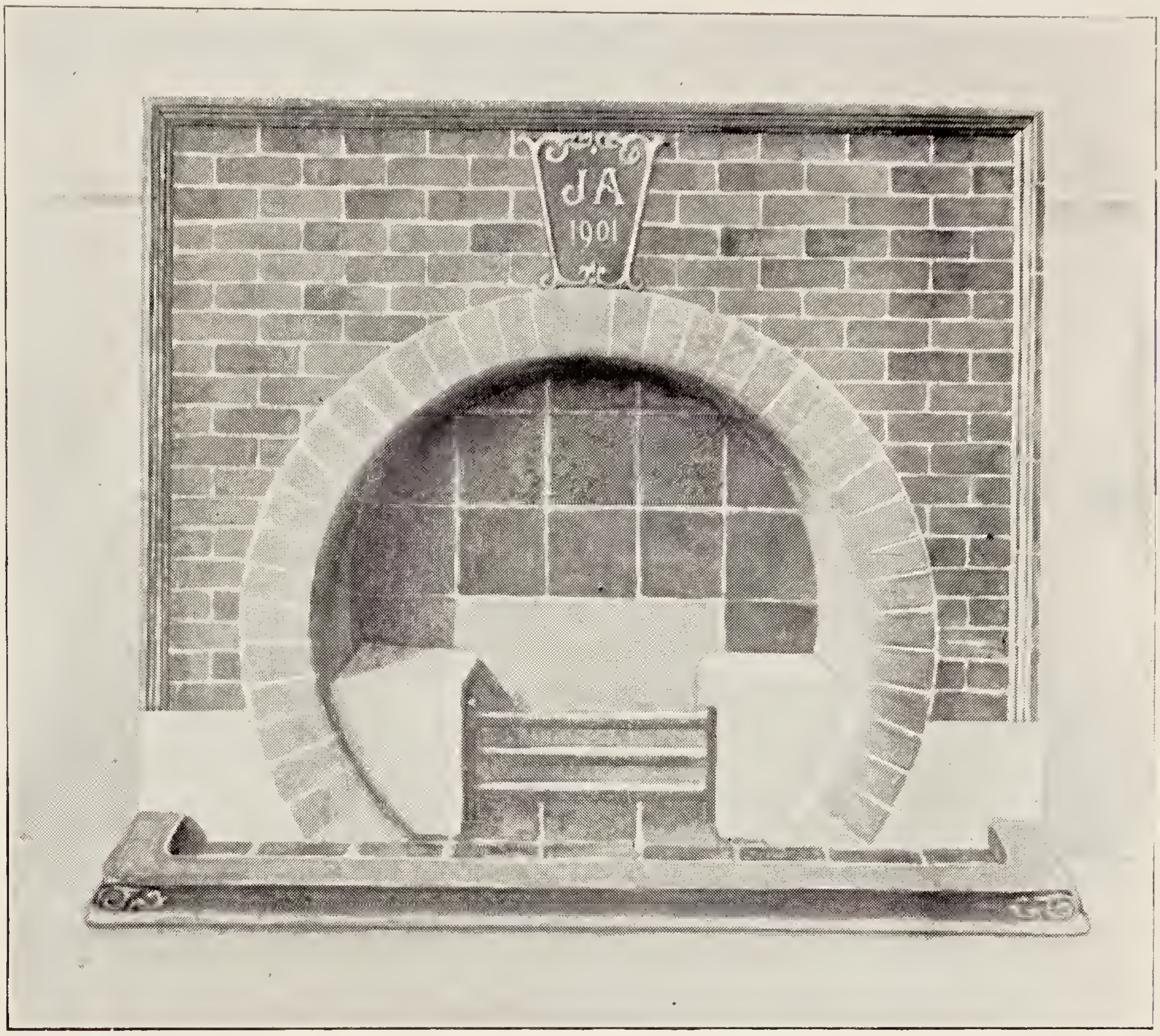
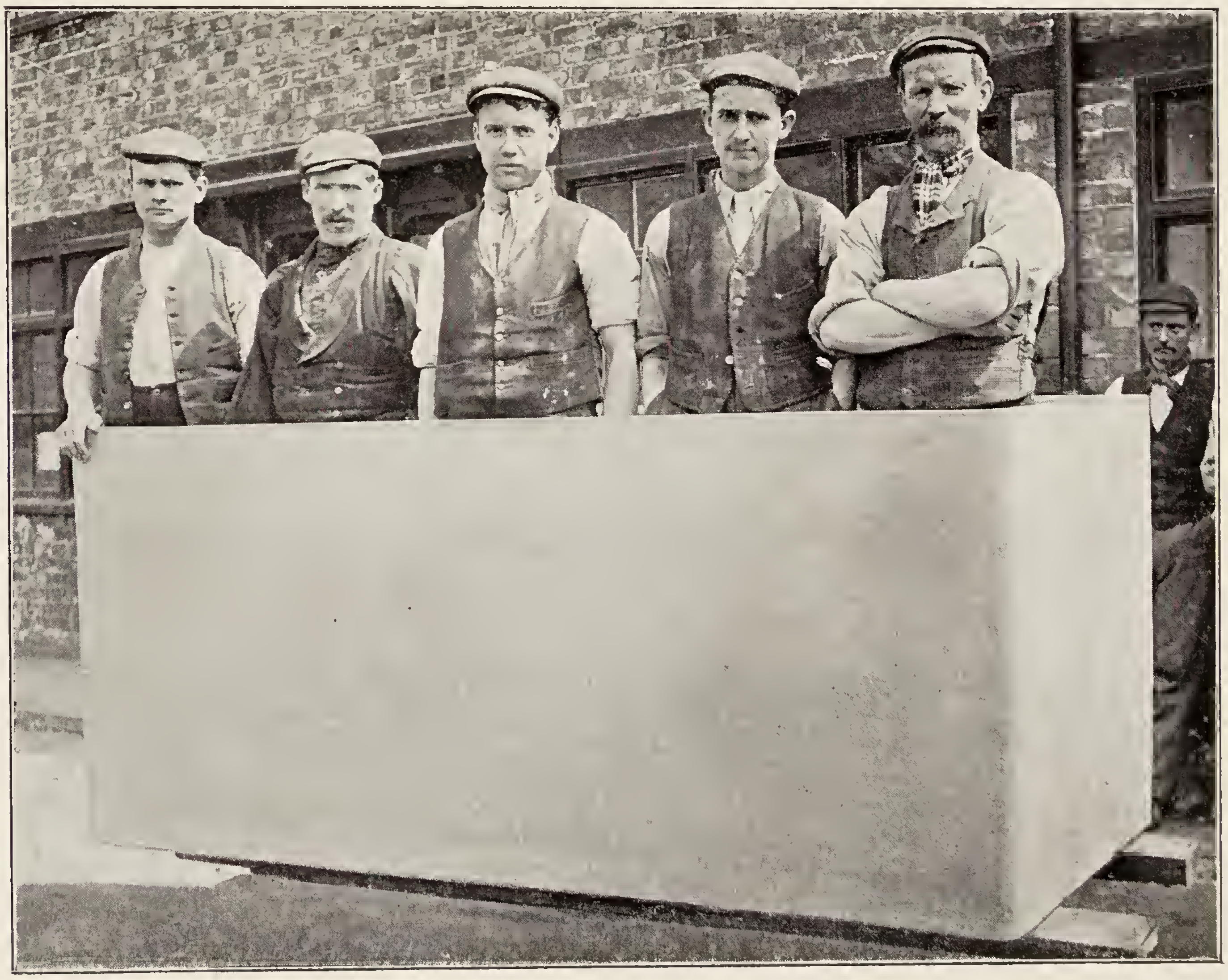


FIG. 81. SEE FIREPLACE LIST.



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